

# Service Manual

Cassette Deck

## RS-M02

(Black Face)  
(Silver Face)

Direct-Drive Concise Cassette Deck with  
Metal Tape Recording Capability



This is the Service Manual for the following areas.

- ..... For All European areas except United Kingdom.
- ▢ ..... For United Kingdom.
- ▣ ..... For Asia, Latin America, Middle East and Africa areas.
- ▤ ..... For Australia.

### RS-M85 MECHANISM SERIES

#### Specifications

|                                  |   |                     |  |
|----------------------------------|---|---------------------|--|
| Track system:                    | 4-track 2-channel stereo recording and playback   | Outputs:            | LINE; output level 650 mV, load impedance 22 k $\Omega$ over   |
| Tape speed:                      | 4.8 cm/s  |                     | HEADPHONE; output level 75 mV, load impedance 8 $\Omega$   |
| Wow and flutter:                 | 0.035% (WRMS), $\pm 0.10\%$ (DIN)   | Bias frequency:     | 85 kHz   |
| Frequency response:              | Metal tape; 20–20,000 Hz<br>30–18,000 Hz (DIN)<br>30–17,000 Hz $\pm 3$ dB<br>(0 VU) 40–13,000 Hz $\pm 3$ dB                                     | Motors:             | 2-motor system<br>Capstan; FG servo control direct-drive motor<br>Reel table; 1-DC coreless motor                      |
|                                  | CrO <sub>2</sub> /Fe-Cr tape; 20–18,000 Hz<br>30–18,000 Hz (DIN)<br>30–16,000 Hz $\pm 3$ dB   | Heads:              | 2-head system<br>1-SX (Sendust Extra) head for record/playback<br>1-Sendust/ferrite double-gap head for erasure        |
|                                  | Normal tape; 20–18,000 Hz<br>30–16,000 Hz (DIN)<br>30–14,000 Hz $\pm 3$ dB  | Power requirements: | AC; 110/125/220/240 V, 50-60 Hz<br>Preset power voltage;<br>240 V for United Kingdom and Australia<br>220 V for Europe |
| Signal-to-noise ratio:           | Dolby NR in; 68 dB (above 5 kHz)<br>Dolby NR out; 58 dB (signal level = max. recording level, Fe-Cr/CrO <sub>2</sub> type tape)                 | Power consumption:  | 24 W   |
| Fast forward and<br>rewind time: | Approx. 80 seconds with C-60 cassette tape  | Dimensions:         | 29.7 cm (W) $\times$ 9.7 cm (H) $\times$ 22.9 cm (D)   |
| Inputs:                          | MIC; sensitivity 0.25 mV, applicable microphone impedance 400 $\Omega$ –10 k $\Omega$<br>LINE; sensitivity 60 mV, input impedance 47 k $\Omega$ | Weight:             | 5.5 kg   |

Specifications are subject to change without notice.

\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

# Technics

Matsushita Electric Trading Co., Ltd.  
P.O. Box 288, Central Osaka Japan

## LOCATION OF CONTROLS AND COMPONENTS

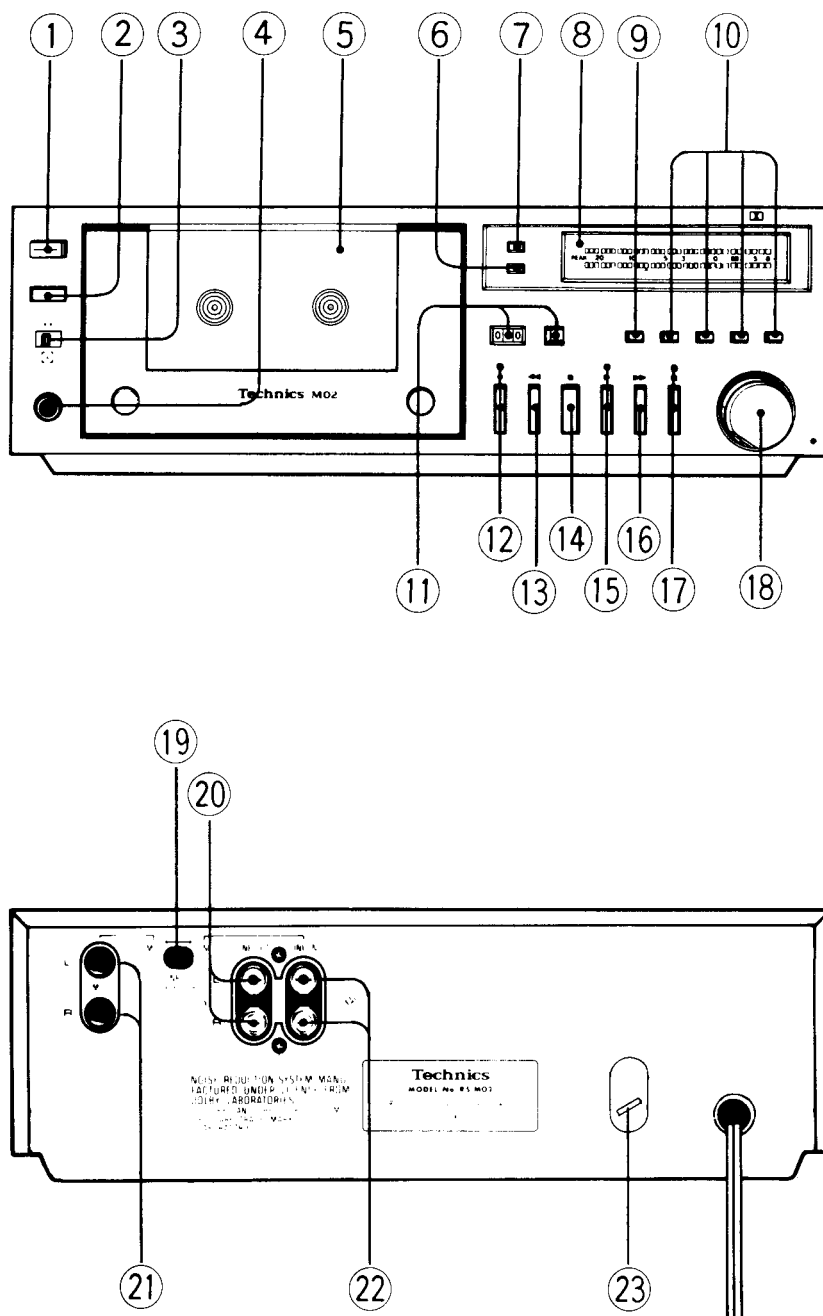


Fig. 1

- |  |  |
|--|--|
| ① Eject button (eject)   | ⑬ Rewind button (rew ◀◀)                   |
| ② Power switch (power)   | ⑭ Stop button (stop ■)                     |
| ③ Timer start switch (timer rec)   | ⑮ Play button with LED (play ▶)            |
| ④ Headphones jack (phones)   | ⑯ Fast forward button (ff ▶▶)              |
| ⑤ Cassette holder  | ⑰ Pause button with LED (pause   )         |
| ⑥ Microphone indication lamp (mic)   | ⑱ Input selector (INPUT SELECTOR MIC/LINE) |
| ⑦ Dolby noise-reduction indication lamp (Dolby NR)   | ⑲ Line output jacks (LINE OUT)             |
| ⑧ FL (fluorescent level) meters  | ⑳ Microphone jacks (MIC)                   |
| ⑨ Dolby noise-reduction switch (Dolby NR)  | ㉑ Line input jacks (LINE IN)               |
| ⑩ Tape selectors (tape select-normal/Fe-Cr/CrO <sub>2</sub> /Metal)  | ㉒ Voltage selector (VOLTAGE SELECTOR)      |
| ⑪ Tape counter and Reset button (counter)  |  |
| ⑫ Record button/Record-muting button with LED (rec <span style="border: 1px solid black; padding: 0 2px;">mute</span> ○) |  |

# DISASSEMBLY INSTRUCTIONS

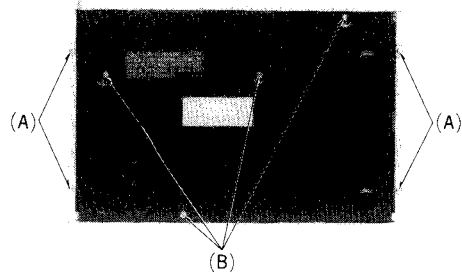


Fig. 2

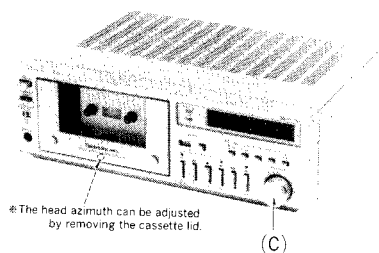


Fig. 3

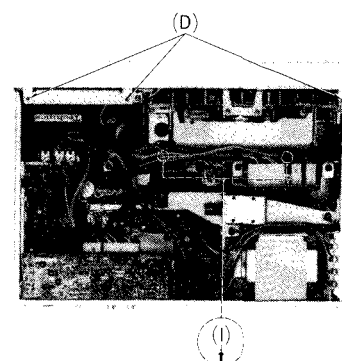


Fig. 4

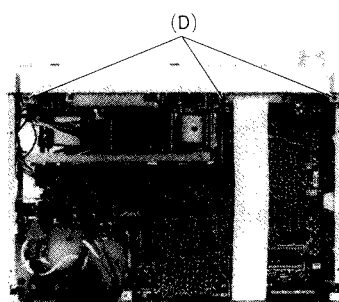


Fig. 5

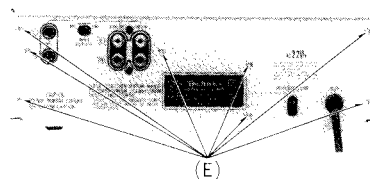


Fig. 6

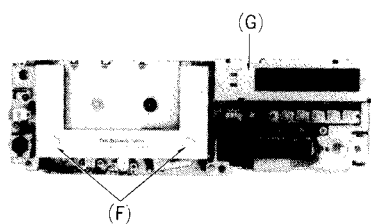


Fig. 7

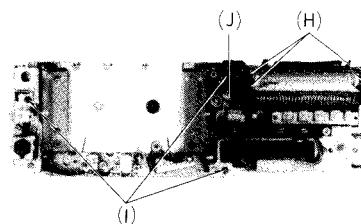


Fig. 8

| Procedure | To remove —    | Remove —   | Shown in fig. — |
|-----------|----------------|--|-----------------|
| 1         | Case cover     | • 4 screws ..... (A)                                   | 2               |
| 2         | Bottom cover   | • 4 screws ..... (B)                                   | 2               |
| 3         | Front panel    | • Control knob ..... (C)<br>• 6 red screws ..... (D)   | 3<br>4, 5       |
| 3         | Back cover     | • 8 screws ..... (E)                                   | 6               |
| 3         | Cassette lid   | • 2 cassette lid holders ..... (F)                     | 7               |
| 6         | FL level meter | • Meter cover ..... (G)<br>• 3 meter holders ..... (H) | 7<br>8          |
| 6         | Mechanism      | • 5 red screws ..... (I)<br>• Counter belt ..... (J)   | 4, 8<br>8       |

# MAIN CONTROL CIRCUIT OPERATION

## Rewind mode

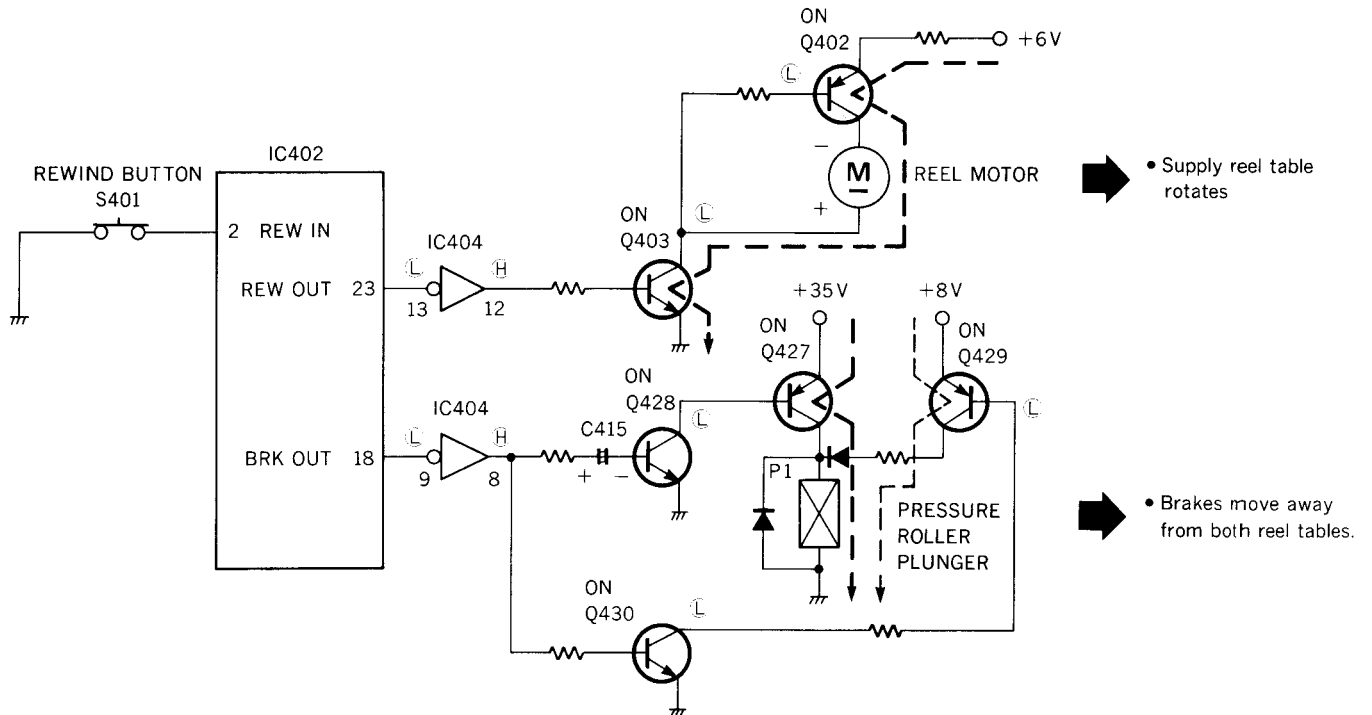


Fig. 9

## Fast forward mode

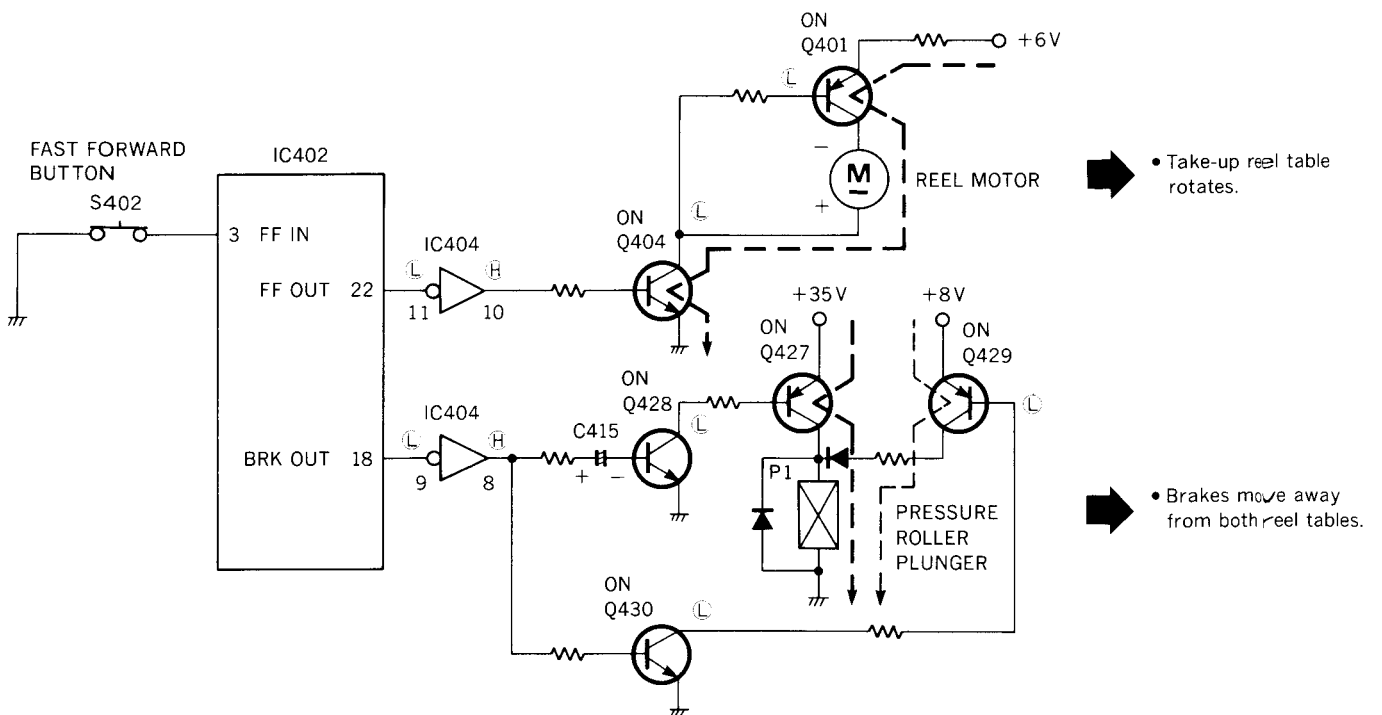
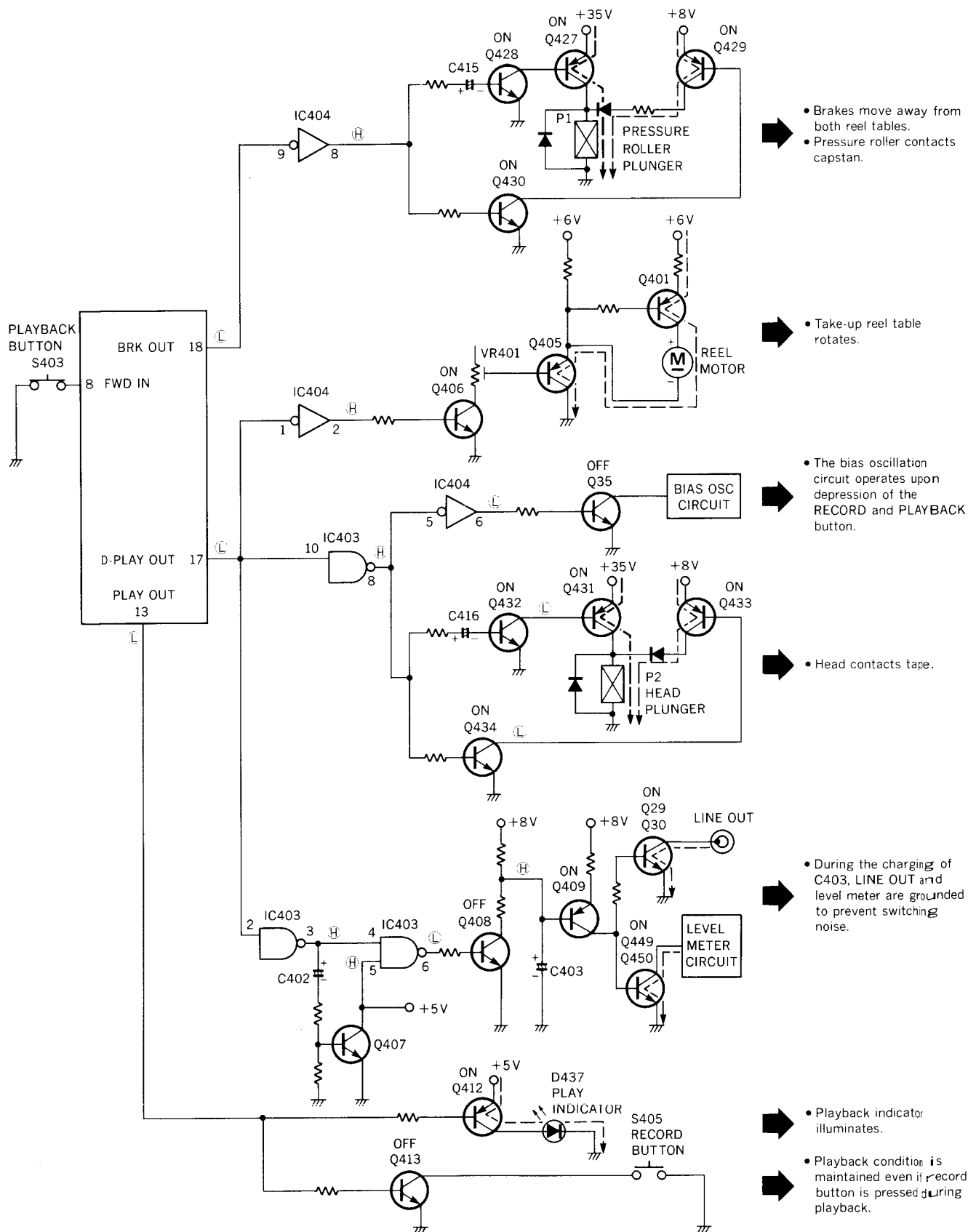


Fig. 10



## Playback mode



## Record mode

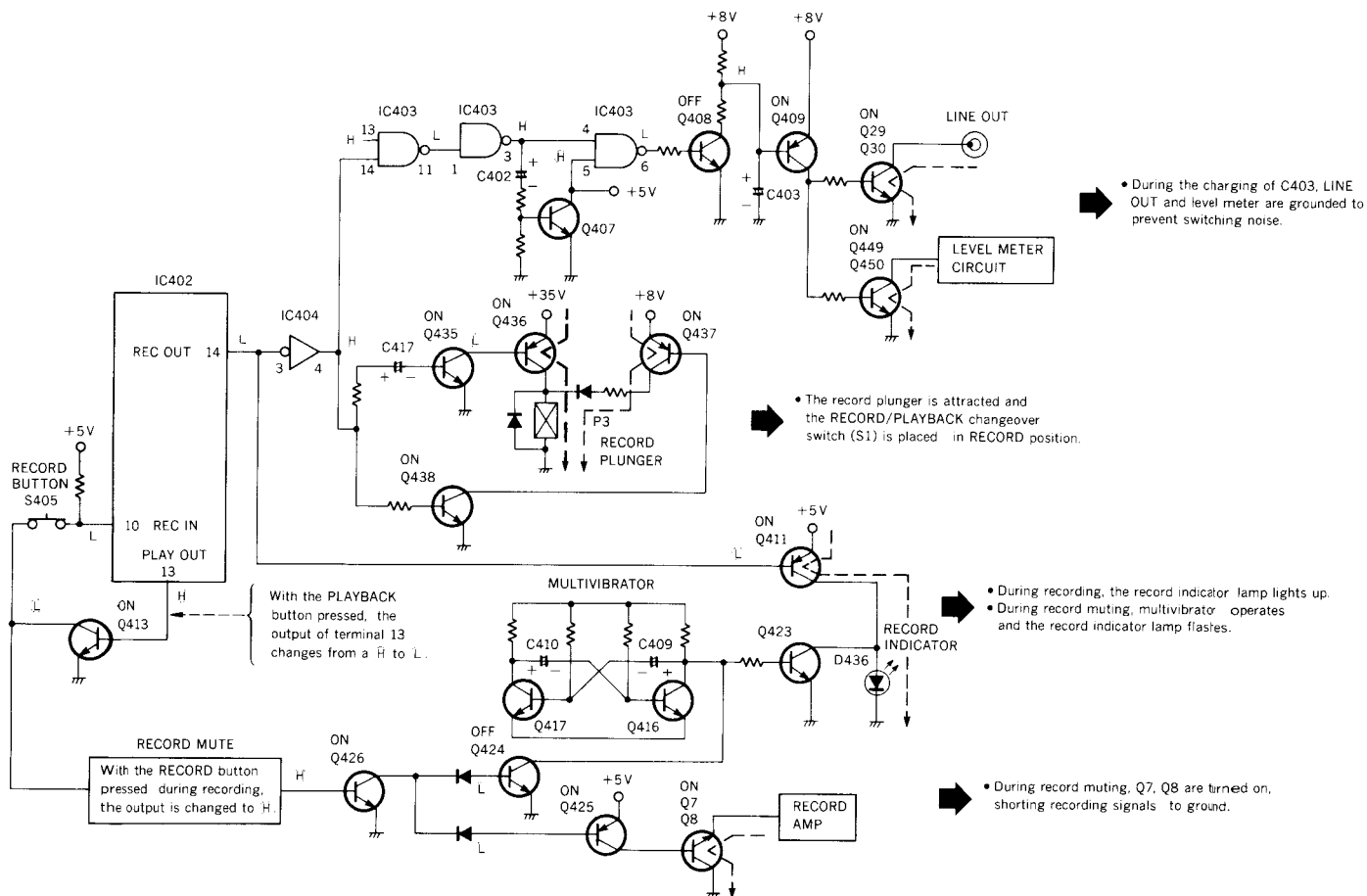


Fig. 12

## Pause mode

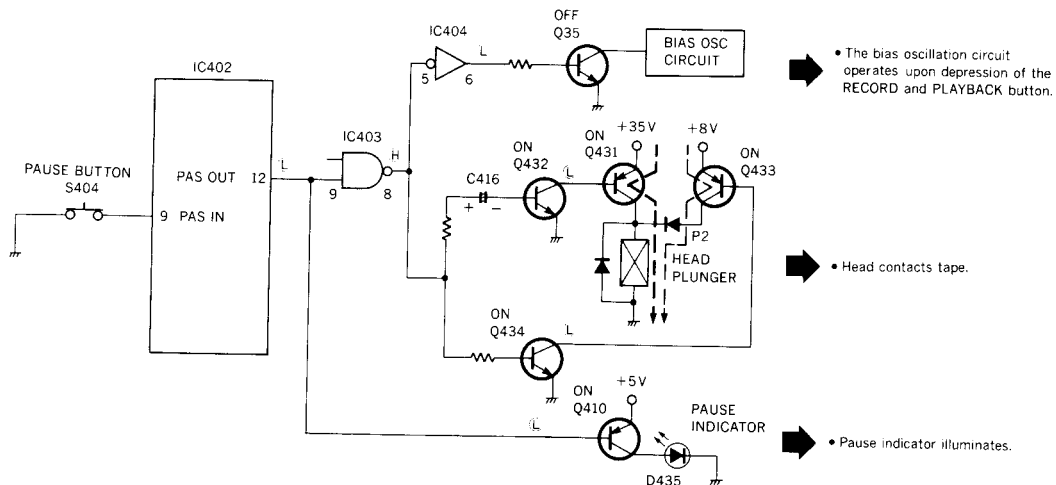


Fig. 13

## Timer recording/playback

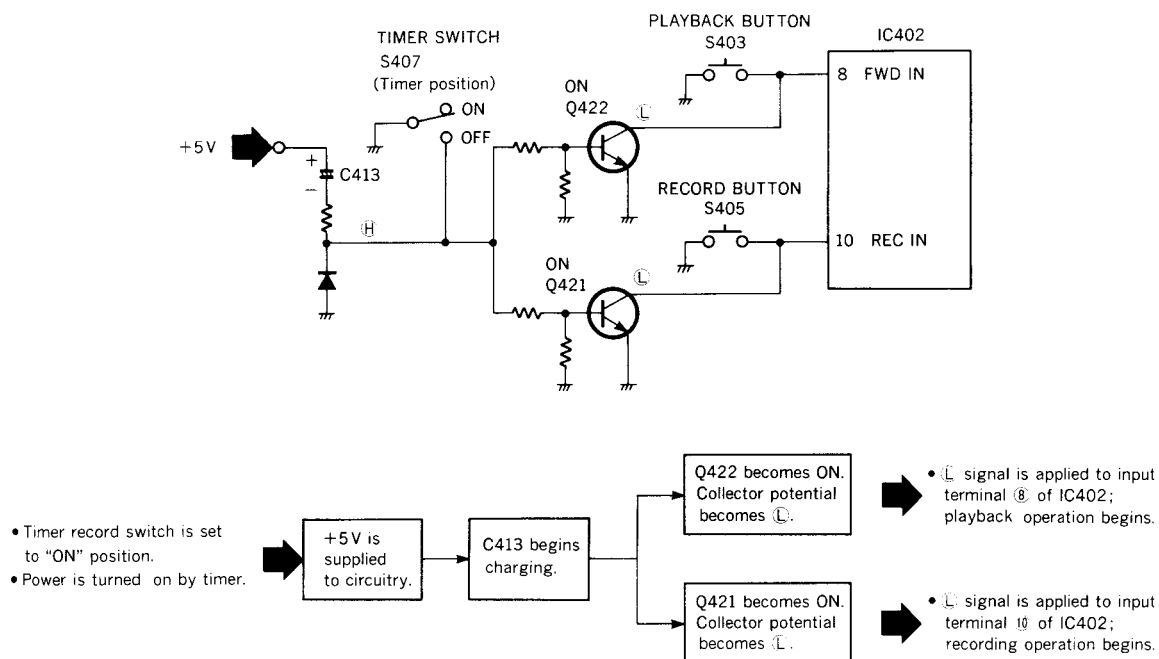


Fig. 14

## Full automatic stop

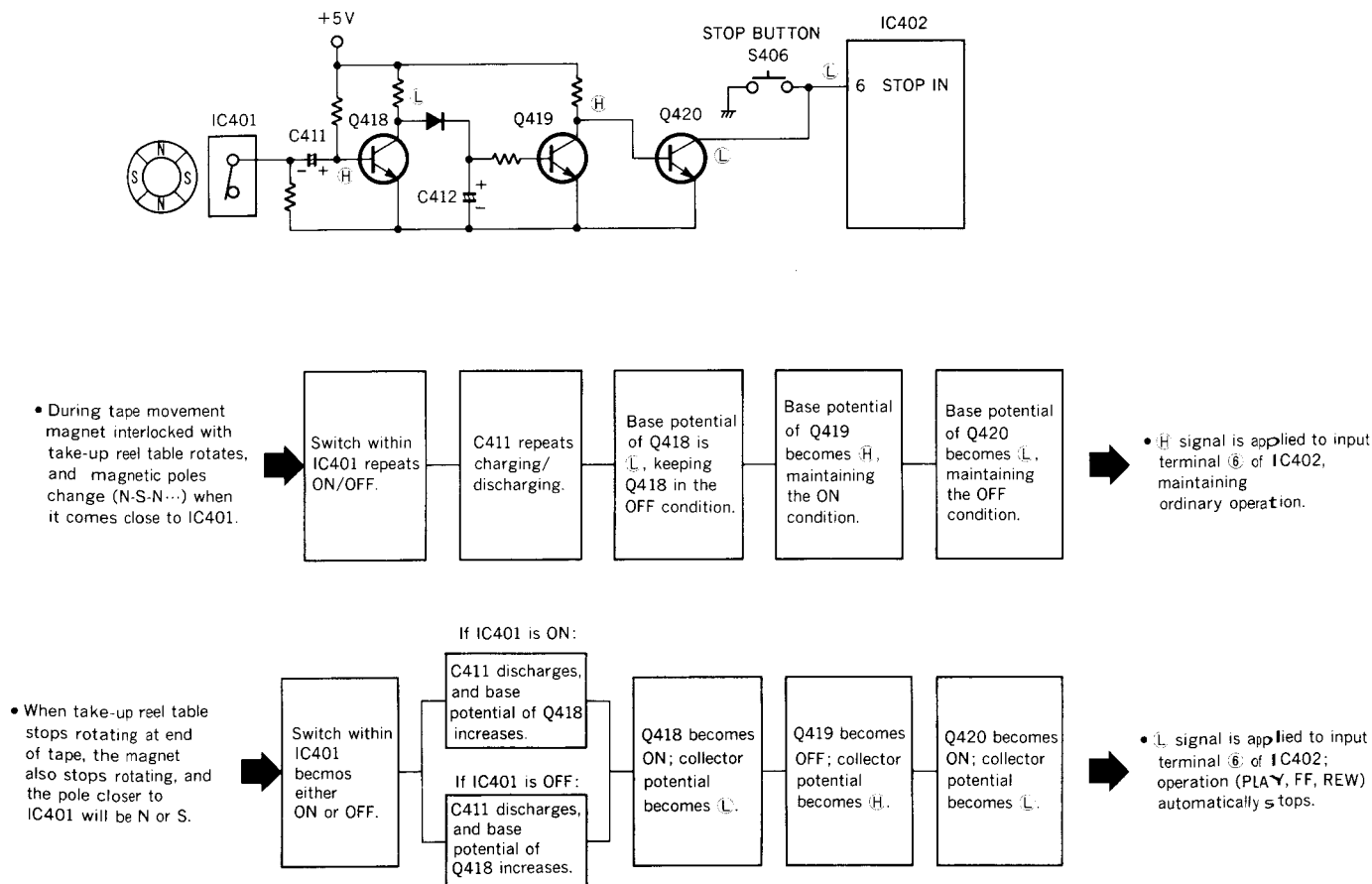


Fig. 15

# CIRCUIT BOARDS AND ADJUSTMENT PARTS LOCATION

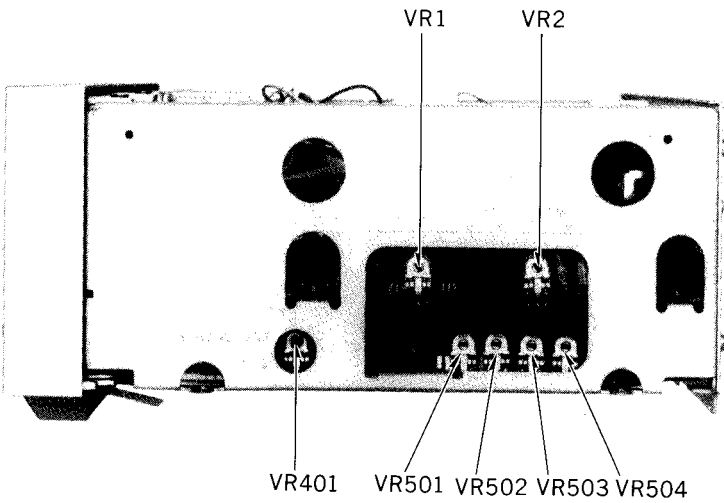
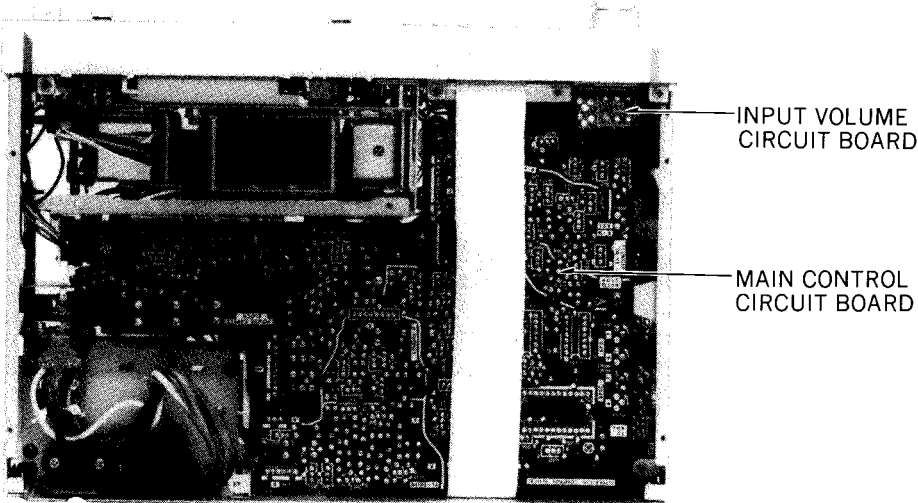
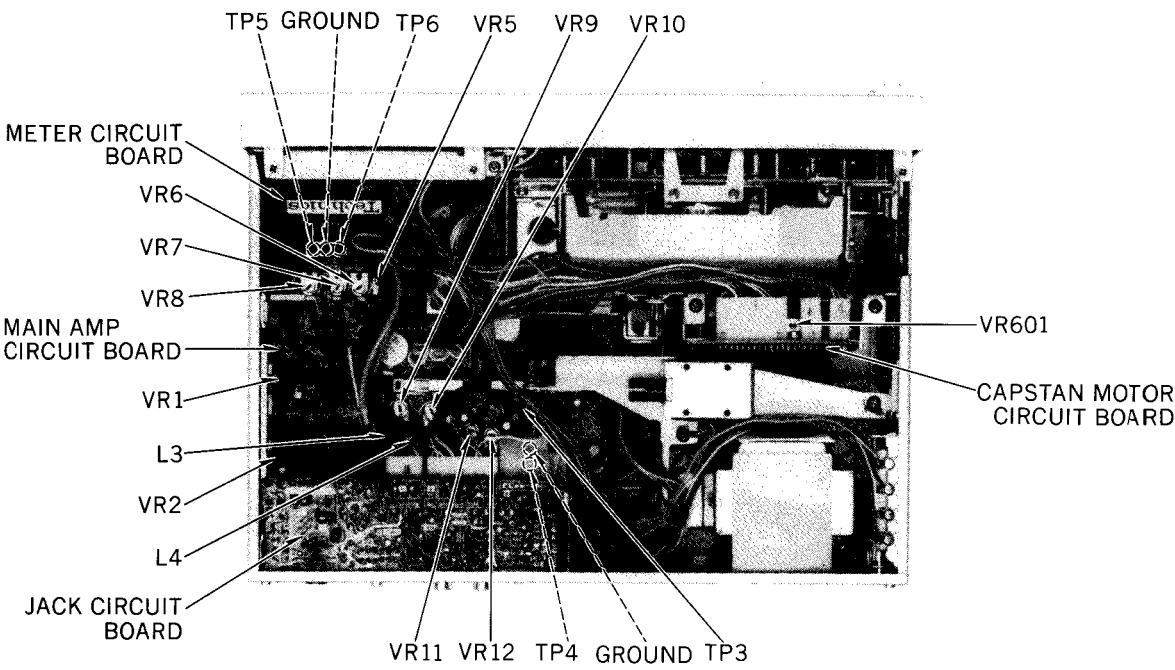
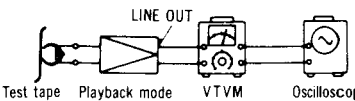
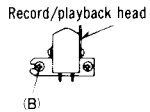
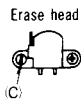
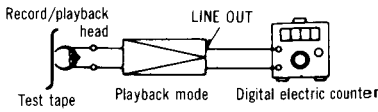


Fig. 16

# MEASUREMENT AND ADJUSTMENT METHODS

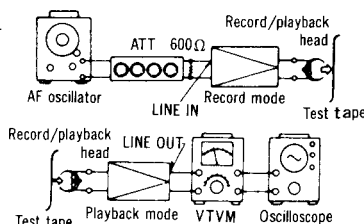

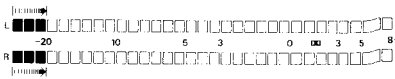
**NOTE:** Set lever switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature:  $20 \pm 5^{\circ}\text{C}$  ( $68 \pm 9^{\circ}\text{F}$ )
- Dolby NR switch: OUT
- Tape selector: Normal
- Input selector: Line in
- Input level control: Maximum

| ITEM   | MEASUREMENT & ADJUSTMENT   |
|--|--|
| <b>A Takeup tension</b><br>Condition:<br>* Playback mode<br>Equipment:<br>* Cassette torque meter (QZZSRKCT)   | <ol style="list-style-type: none"> <li>1. Mount cassette torque meter on UNIT.</li> <li>2. Place UNIT into playback mode and read takeup torque.</li> <li>3. Measure several times and determine the mean value.</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Standard value: <math>35 \pm 5 \text{ gr-cm}</math></div> <ol style="list-style-type: none"> <li>4. If measured value is not in standard, adjust VR401.</li> </ol>  |
| <b>B Head azimuth adjustment</b><br>Condition:<br>* Playback mode<br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Test tape (azimuth) ... QZZCFM<br>* Tape path viewer ... QZZCRD | <p><b>Record/playback head adjustment</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 17.</li> <li>2. Playback azimuth tape (QZZCFM 8kHz).</li> <li>3. Adjust record/playback head angle adjustment screw (B) in fig. 18 so that output level at LINE OUT becomes maximum.</li> <li>4. Measure both channels, and adjust levels for equal output.</li> <li>5. After adjustment lock head adjustment screw with lacquer.</li> </ol> <p><b>Erase head adjustment</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM).</li> <li>2. Playback this tape.</li> <li>3. Adjust screw (C) shown in fig. 19 so that the tape may not get curled or malformed by tape guide of the erase head.</li> <li>4. After adjustment, lock head adjust screw with lacquer.</li> </ol> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Fig. 17</p> </div> <div style="text-align: center;">  <p>Fig. 18</p> </div> <div style="text-align: center;">  <p>Fig. 19</p> </div> </div>  |
| <b>C Tape speed</b><br>Condition:<br>* Playback mode<br>Equipment:<br>* Digital electronic counter<br>* Test tape ... QZZCWAT  | <p><b>Tape speed accuracy</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 20.</li> <li>2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter.</li> <li>3. Measure this frequency.</li> <li>4. On the basis of 3,000Hz, determine value by following formula:</li> </ol> $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ <p style="text-align: center;">where, f = measured value</p> <ol style="list-style-type: none"> <li>5. Take measurement at middle section of tape.</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Standard value: <math>\pm 0.5\%</math></div> <ol style="list-style-type: none"> <li>6. If measured value is not within standard, adjust VR601.</li> </ol> <p><b>Tape speed fluctuation</b></p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ <p style="text-align: center;"><math>f_1</math> = maximum value, <math>f_2</math> = minimum value</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Standard value: Less than 0.3%</div> <div style="text-align: center;">  <p>Fig. 20</p> </div> |

| ITEM  | MEASUREMENT & ADJUSTMENT  |
|---|---|
| <b>D Playback frequency response</b><br>Condition:<br>* Playback mode<br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Test tape ... QZZCFM | <ol style="list-style-type: none"> <li>Test equipment connection is as same as "Head azimuth adjustment" but use the test tape (QZZCFM) instead of head azimuth tape (See fig. 17).</li> <li>Place UNIT into playback mode.</li> <li>Playback the frequency response test tape (QZZCFM).</li> <li>Measure output level at 12.5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, and compare each output level with the standard frequency 315 Hz, at LINE OUT.</li> <li>Make measurement for both channels.</li> <li>Make sure that the measured value is within the range specified in the frequency response chart.</li> </ol> <div data-bbox="953 360 1439 584"> <p>Playback frequency response chart</p> </div> <p>Fig. 21</p>   |
| <b>E Playback gain</b><br>Condition:<br>* Playback mode<br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Test tape ... QZZCFM               | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 17.</li> <li>Playback standard recording level portion on test tape (QZZCFM 315Hz), and using VTVM measure the output level at LINE OUT jack.</li> <li>Make measurement for both channels.</li> </ol> <div data-bbox="545 853 906 898"> <p>Standard value: <math>0.65 \pm 0.10 V</math></p> </div> <p>Adjustment</p> <ol style="list-style-type: none"> <li>If measured value is not standard, adjust VR11 (L-CH), VR12 (R-CH) (See fig. 16).</li> <li>After adjustment, check "Playback frequency response" again.</li> </ol>  |
| <b>F Bias leak</b><br>Condition:<br>* Record mode<br>* Input level control ... MAX<br>Equipment:<br>* VTVM * Oscilloscope                 | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 22 (See AMP circuit board on page 10).</li> <li>Place UNIT into record mode.</li> <li>Adjust trap coils L3 (L-CH), L4 (R-CH), so that measured value becomes minimum (See fig. 16).</li> <li>Make adjustment for both channels.</li> </ol> <div data-bbox="1130 1048 1467 1211"> </div> <p>Fig. 22</p>  |
| <b>G Erase current</b><br>Condition:<br>* Record mode<br>Equipment:<br>* VTVM<br>* Oscilloscope   | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 23.</li> <li>Place UNIT into record mode and measure voltage at test point 7.</li> <li>Determine erase current with the following formula:<br/> <math display="block">\text{Erase current (A)} = \frac{\text{Voltage across both ends of R274}}{1 (\Omega)}</math> </li> </ol> <div data-bbox="545 1451 1110 1496"> <p>Standard value: <math>95 \pm 5 \text{ mA}</math> (Tape selector ... Metal)</p> </div> <ol style="list-style-type: none"> <li>If measured value is not within standard, adjust VR8.</li> </ol>  |
| <b>H Bias current</b><br>Condition:<br>* Record mode<br>* Bias adjustment control ... Center<br>Equipment:<br>* VTVM<br>* Oscilloscope    | <p><b>A. Adjustment for metal position</b></p> <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 24.</li> <li>Place the test tape (QZZCRZ) in the cassette holder.</li> <li>Press the record and pause buttons.</li> <li>Set the tape selector to metal position.</li> <li>Supply 1 kHz signal from AF oscillator, through ATT to LINE IN.</li> <li>Adjust ATT so that input level is <math>-20 \text{ dB}</math> below standard recording level.</li> <li>At this time, LINE OUT level indicates <math>0.065 V</math>.</li> <li>Record 1 kHz and 15 kHz signals.</li> <li>Playback and express in dB the difference between output levels of 15 kHz and 1 kHz.</li> <li>Make sure output level of 15 kHz is not within <math>-1 \pm 3 \text{ dB}</math> compared with output level of 1 kHz.</li> <li>If measured value is not within <math>-1 \pm 3 \text{ dB}</math>, adjust VR9 (L-CH only).</li> </ol> <div data-bbox="1125 1585 1467 1832"> </div> <p>Fig. 24</p> <div data-bbox="1130 1854 1467 1989"> </div> <p>Fig. 25</p> |



| ITEM  | MEASUREMENT & ADJUSTMENT  |
|---|---|
|   | <p><b>B. Adjustment for normal position</b></p> <ol style="list-style-type: none"> <li>Set the tape selector to normal position (test tape QZZCRA).</li> <li>Change test tape to normal tape (QZZCRA).</li> <li>Press the record and playback buttons.</li> <li>Record 1 kHz and 13 kHz signals.</li> <li>Playback and express in dB the difference between output levels of 13 kHz and 1 kHz.</li> <li>Make sure output level of 13 kHz is not within <math>0 \pm 3</math> dB compared with output level of 1 kHz.</li> <li>If measured value is not within <math>0 \pm 3</math> dB, adjust VR5 (L-CH, R-CH), VR10 (R-CH).</li> </ol> <p><b>C. Adjustment for Fe-Cr and CrO<sub>2</sub> positions</b></p> <ol style="list-style-type: none"> <li>Set the tape selector to Fe-Cr position.</li> <li>Change test tape to Fe-Cr tape (QZZCRY).</li> <li>Press the record and playback buttons.</li> <li>Record 1 kHz and 14 kHz signals.</li> <li>Playback and express in dB the difference between output levels of 14 kHz and 1 kHz.</li> <li>Make sure output level of 14 kHz is not within <math>0 \pm 3</math> dB, compared with output level of 1 kHz.</li> <li>If measured value is not within <math>0 \pm 3</math> dB, adjust VR6.</li> <li>Set the tape selector to CrO<sub>2</sub> position.</li> <li>Change test tape to CrO<sub>2</sub> tape (QZZCRX).</li> <li>Make the same measurements described in steps 21 to 24 above.</li> <li>If measured value is not within <math>0 \pm 3</math> dB, adjust VR7.</li> </ol> <p><b>Measurement</b></p> <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 25.</li> <li>Place UNIT into record mode.</li> <li>Read voltage on VTVM and calculate bias current by following formula:</li> </ol> $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Standard value: around 560μA (Metal position), around 300μA (Normal position), around 320μA (Fe-Cr position), around 415μA (CrO<sub>2</sub> position)</p> </div> |
| <p><b>① Overall gain</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* Input level control ... MAX</li> <li>* Standard input level:<br/>MIC ..... <math>-72 \pm 3</math> dB<br/>LINE IN ... <math>-24 \pm 3</math> dB</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> <li>* Oscilloscope</li> <li>* Test tape (reference blank tape)</li> <li>... QZZCRA for Normal</li> <li>... QZZCRX for CrO<sub>2</sub></li> <li>... QZZCRY for Fe-Cr</li> <li>... QZZCRZ for Metal</li> </ul> | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 26.</li> <li>Place UNIT into record mode.</li> <li>Supply 1 kHz signal (<math>-24</math> dB) from AF oscillator, through ATT to LINE IN.</li> <li>Adjust ATT until monitor level at LINE OUT becomes 0.65 V.</li> <li>Using test tape, make recording.</li> <li>Playback recorded tape, and measure the output level at LINE OUT on VTVM.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Standard value: <math>0.65 \pm 0.10</math> V</p> </div> <ol style="list-style-type: none"> <li>If measured value is not within standard, adjust the following VR.<br/>VR1 (L-CH), VR2 (R-CH)</li> </ol> <div style="text-align: right;">  <p><b>Fig. 26</b></p> </div>  |
| <p><b>② Fluorescent meter</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record mode</li> <li>* Input level control ... MAX</li> <li>* Tape selectors ... Normal position</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> </ul>   | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 27.</li> <li>Supply 1 kHz signal (<math>-24</math> dB) to the LINE IN jack, then press the record button.</li> <li>Adjust the ATT so that the output level at LINE OUT jack becomes 0.65 V (= standard input level).</li> <li>Adjustment at "0 dB":             <ol style="list-style-type: none"> <li>Adjust VR501 (L-CH) and VR502 (R-CH) so that the Fluorescent meters show an illuminated indication up to "0 dB" when the input signal level is 0.9 dB higher than the standard input level.</li> </ol> </li> </ol> <div style="text-align: right;">  <p><b>Fig. 27</b></p>  <p><b>Fig. 28</b></p> </div>   |

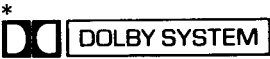
| ITEM   | MEASUREMENT & ADJUSTMENT   |
|--|--|
|  | <p>B. Then confirm that the Fluorescent meters show an illuminated indication up to "+1 dB" when the input signal level is 1 dB higher than the standard input level.</p> <p>5. Adjustment at "-20 dB":</p> <p>A. Adjust VR503 (L-CH) and VR504 (R-CH) so that the Fluorescent meters show an illuminated indication up to "-20 dB" when the input signal level is 15.1 dB lower than the standard input level.</p> <p>B. Then confirm that the Fluorescent meters show an illuminated indication up to "-15 dB" when the input signal level is 15 dB lower than the standard input level.</p> <p>6. Repeat twice between steps 2 and 5 above.</p>   |
| <p><b>K Overall frequency response</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* Input level control ... MAX</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> <li>* Test tape (reference blank tape)             <ul style="list-style-type: none"> <li>... QZZCRA for Normal</li> <li>... QZZCRX for CrO<sub>2</sub></li> <li>... QZZCRY for Fe-Cr</li> <li>... QZZCRZ for Metal</li> </ul> </li> </ul> | <p><b>Note:</b></p> <p>Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).</p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 26.</li> <li>2. Load reference blank test tape and place UNIT into record mode.</li> <li>3. Supply 1 kHz signal from AF oscillator through ATT to LINE IN.</li> <li>4. Adjust ATT so that input level is -20 dB below standard recording level (standard recording level = 0 VU).</li> <li>5. At this time, LINE OUT level indicates 0.065 V.</li> <li>6. Record each frequency 30 Hz, 70 Hz, 100 Hz, 200 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz, 12 kHz, and 13 kHz (14 kHz for CrO<sub>2</sub> and Fe-Cr, 15 kHz for Metal).</li> <li>7. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz.</li> <li>8. Make sure that the measured value is within the range specified in the overall frequency response chart.</li> </ol> <div data-bbox="921 629 1459 846"> <p><b>Overall frequency response chart (Normal)</b></p> </div> <p><b>Fig. 29</b></p> <div data-bbox="921 891 1459 1108"> <p><b>Overall frequency response chart (Fe-Cr, CrO<sub>2</sub>)</b></p> </div> <p><b>Fig. 30</b></p> <div data-bbox="921 1160 1459 1377"> <p><b>Overall frequency response chart (Metal)</b></p> </div> <p><b>Fig. 31</b></p> <p><b>Adjustment</b></p> <ol style="list-style-type: none"> <li>1. When the frequency response between the middle and high frequency range becomes higher than the standard value, as shown by the solid line in fig. 32 increase, refer to bias current adjustment.</li> <li>2. When it becomes lower, as shown by dotted line, refer to bias current adjustment.</li> </ol> <div data-bbox="1103 1442 1412 1653"> </div> <p><b>Fig. 32</b></p> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. For adjustment when the bias current is lower than the standard value use the procedure indicated in adjustment 2, because reducing the bias current beyond this point may worsen the distortion factor.</li> <li>2. For the method of bias current measurement, refer to "Bias current adjustment" on page 9.</li> </ol> |



# Service Manual

Supplement-2

Direct-Drive Concise Cassette Deck with  
Metal Tape Recording Capability



Cassette Deck  
**RS-M02**  
(Black Face)  
(Silver Face)

Please use this manual together with the service manual for  
model No. RS-M02 (original) order No. ARD-7908072C and  
Supplement-1 order No. ARD-8006066S.

This is the Service Manual for the  
following areas.

- ..... For all European areas  
except United Kingdom.
- ▢ ..... For United Kingdom.
- ▣ ..... For Asia, Latin America,  
Middle East and Africa  
areas.
- ▤ ..... For Australia.

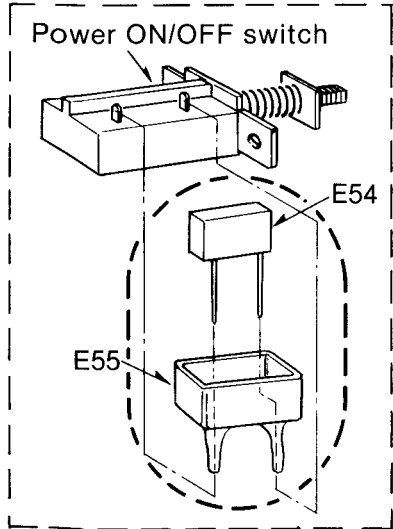
**PARTS COMPARISON TABLE :**

Please revise the original parts list in the Service Manual to conform to the  
changes shown herein.  
If new parts number are shown, be sure to use them when ordering parts.

Important safety notice.  
Components identified by Δ mark have special  
characteristics important for safety.  
When replacing any of these components, use  
only manufacturer's specified parts.

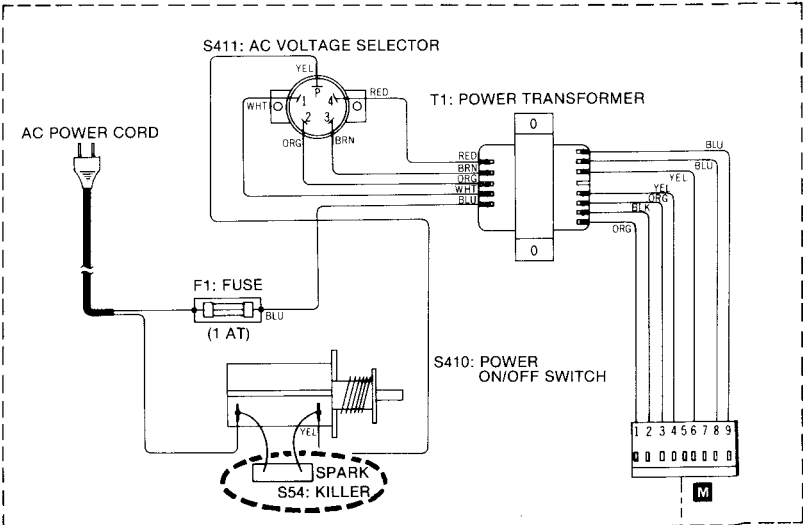
| Ref. No.  | Parts Name & Description | Parts Number |              | Remarks |
|---|--------------------------|--------------|--------------|---------|
|   |                          | Former Type  | New Type     |         |
| M28   | Shield Plate             | QTS1451      | QTS1491      |         |
| VR13, 14  | Variable Resistor        | EWKNXAF22A54 | EWJSEAF22A54 |         |
| E31   | Shield Plate (for T1)    | QTS1488      | QTS1503      |         |
| E54   | ▣ Δ Spark Killer         |              | QCR008T      | Added   |
| ※For Asia, Latin America, Middle East and Africa areas. |                          |              |              |         |
| E55   | ▣ Spark Killer Cover     |              | QTW1118      | Added   |
| ※For Asia, Latin America, Middle East and Africa areas. |                          |              |              |         |

**ELECTRICAL PARTS  
LOCATION (ADDITION)**



\* For Asia, Latin America, Middle  
East and Africa areas.

**WIRING CONNECTION DIAGRAM**



\* For Asia, Latin America, Middle  
East and Africa areas.

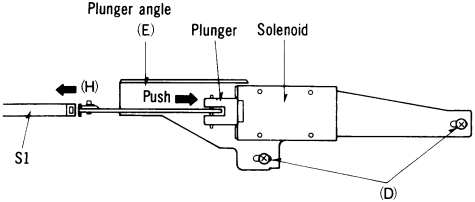
\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

**Technics**

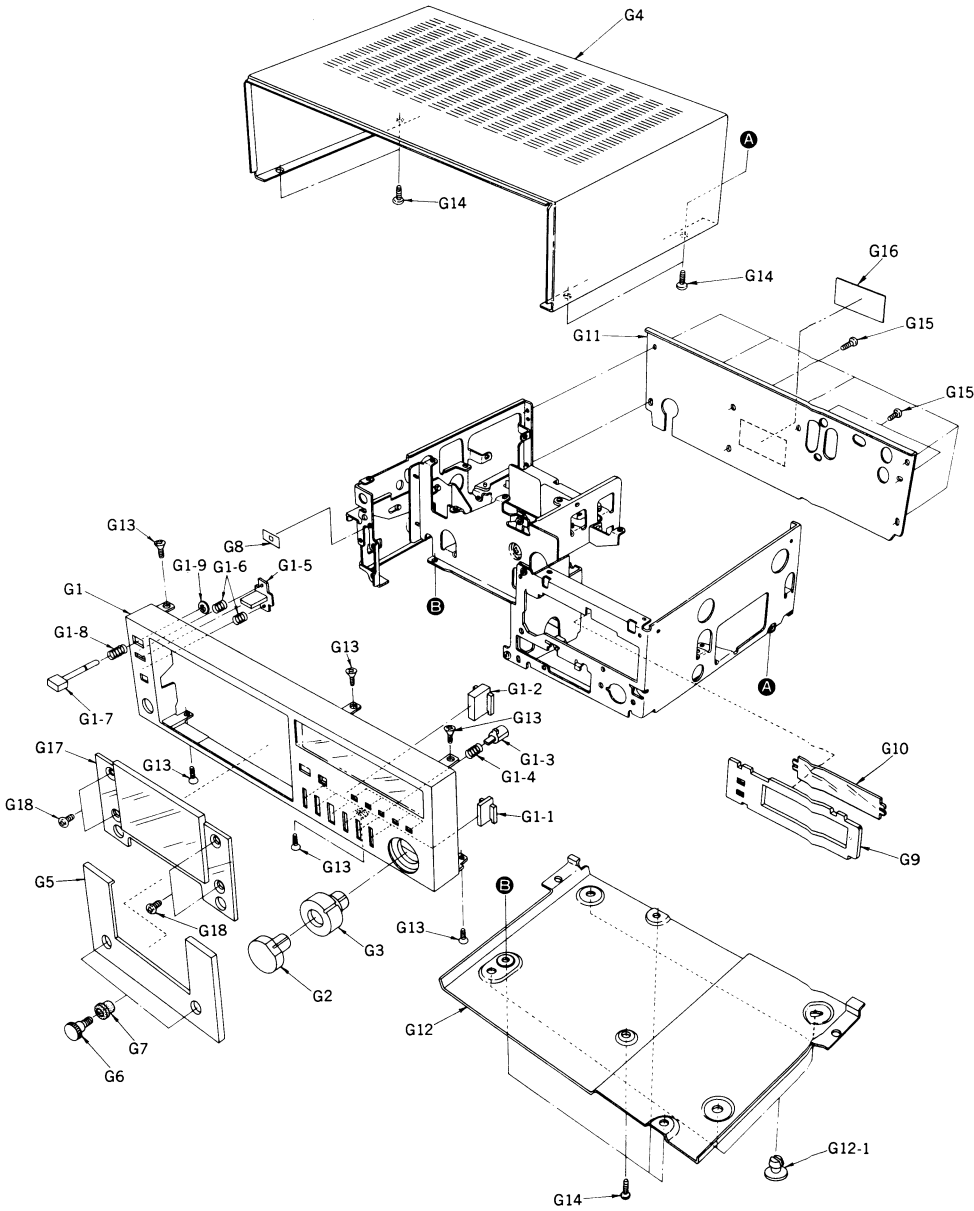
Matsushita Electric Trading Co., Ltd.  
P.O. Box 288, Central Osaka Japan

(ARD, H.M) Printed in Japan.

CABINET PARTS

| ITEM   | MEASUREMENT & ADJUSTMENT   |
|--|--|
| <p><b>L</b> Dolby NR circuit</p> <p>Condition:</p> <ul style="list-style-type: none"><li>* Record mode</li><li>* Input level control ... MAX</li></ul> <p>Equipment:</p> <ul style="list-style-type: none"><li>* VTVM      * AF oscillator</li><li>* ATT        * Oscilloscope</li></ul> | <ol style="list-style-type: none"><li>Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP3 (L-CH), TP4 (R-CH) (frequency 5kHz).</li><li>Confirm that the value at IN position is 8 (±2.5)dB greater than the value at OUT position of Dolby NR switch.</li></ol>  |
| <p><b>M</b> Record plunger position adjustment</p>   | <ol style="list-style-type: none"><li>Loosen screws (D) shown in fig. 33.</li><li>Push the plunger all the way into the solenoid as shown in fig. 33.</li><li>Move plunger angle (E), so that the record/playback select switch (S1) is completely shifted in the direction of arrow (H) as shown in fig. 33.</li><li>After adjustment, lock screws (D) with lacquer.</li></ol> <div></div> <p>Fig. 33</p> |

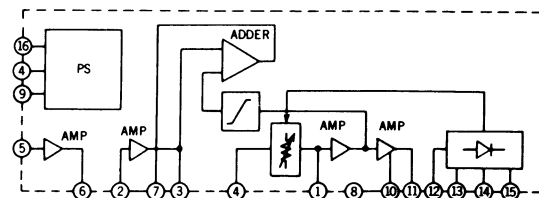
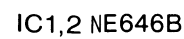
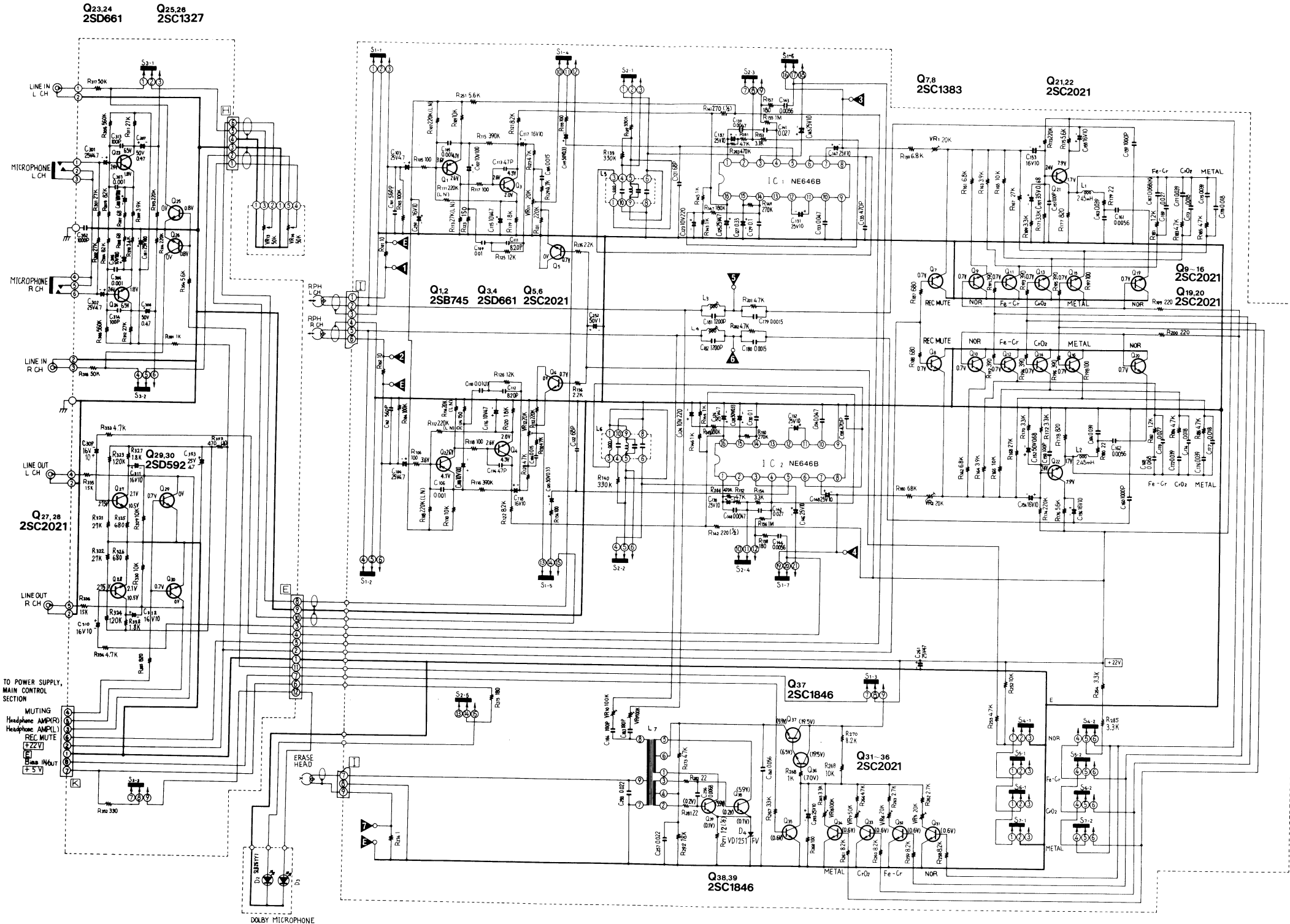
| Ref. No.  | Part No.  | Part Name & Description     |
|---|---|-----------------------------|
| <b>CABINET PARTS</b>                                    |   |                             |
| G1  | QYP0893<br>"Silver Type"<br>QYP0893K<br>"Black Type"    | Front Panel Assembly        |
| G1-1  | QG01585<br>"Silver Type"<br>QG01585K<br>"Black Type"    | Push Button (A)             |
| G1-2  | QG01586<br>"Silver Type"<br>QG01586K<br>"Black Type"    | Push Button (B)             |
| G1-3  | QG01596<br>"Silver Type"<br>QG01596K<br>"Black Type"    | Push Button (Select Button) |
| G1-4  | QBC1148   | Spring                      |
| G1-5  | QG01594<br>"Silver Type"<br>QG01594K<br>"Black Type"    | Push Button (Power ON/OFF)  |
| G1-6  | QBC1187   | Spring                      |
| G1-7  | QXB0642<br>"Silver Type"<br>QXB0642K<br>"Black Type"    | Push Button (Eject Button)  |
| G1-8  | QBC1188   | Spring                      |
| G1-9  | XUC25FT   | Stop Ring                   |
| G2  | QYT0540<br>"Silver Type"<br>QYT0540K<br>"Black Type"    | Volume Knob (A)             |
| G3  | QYT0541<br>"Silver Type"<br>QYT0541K<br>"Black Type"    | Volume Knob (B)             |
| G4  | QGC1145<br>"Silver Type"<br>QGC1145K<br>"Black Type"    | Case Cover                  |
| G5  | QK2967<br>"Silver Type"<br>QK2967K<br>"Black Type"      | Cassette Lid                |
| G6  | QH01291<br>"Silver Type"<br>QH01291K<br>"Black Type"    | Cassette Lid Holding Screw  |
| G7  | QBG1551   | Cushion Rubber              |
| G8  | QGB1962<br>"Silver Type"<br>QGB1962K<br>"Black Type"    | Switch Cover                |
| G9  | QKJ0360<br>"Silver Type"<br>QKJ0360K<br>"Black Type"    | Meter Cover (A)             |
| G10   | QGL1140   | Meter Cover (B)             |
| G11   | QGC1172<br>"Silver Type"<br>QGC1172K<br>"Black Type"    | Rear Board                  |
| G12   | QYB0395   | Bottom Cover Assembly       |
| *For All European areas and Australia.                  |   |                             |
| G12-1   | QKA1080   | Rubber Foot                 |
| G13   | XTS3+8BFX   | Screw ±3×8                  |
| G14   | XTB3+8JFX<br>"Silver Type"<br>XTB3+8JFX<br>"Black Type" | Screw ±3×8                  |
| G15   | XTB3+8JFX   | Screw ±3×8                  |
| G16   | QGS2716   | Main Name Plate             |
| *For All European areas except United Kingdom.          |   |                             |
| G17   | QGS2717   | "                           |
| *For United Kingdom and Australia.                      |   |                             |
| G18   | QGS2718   | "                           |
| *For Asia, Latin America, Middle East and Africa areas. |   |                             |
| G17   | QGR0108   | Cassette Lid                |
| G18   | XSN26+4   | Screw ±2.6×4                |
| <b>ACCESSORIES</b>                                      |   |                             |
| A1  | RP023A  | Connection Cord             |
| A2  | QFTC30S011TZ  | Demonstration Tape          |



| Ref. No.  | Part No.    | Part Name & Description |
|---|-------------|-------------------------|
| A3  | QJP0603S    | AC Plug Adaptor         |
| *For Asia, Latin America, Middle East and Africa areas. |             |                         |
| A4  | QQT2675     | Instruction Book        |
| *For All European areas except United Kingdom.          |             |                         |
|   | QQT2674     | "                       |
| *For United Kingdom and Australia.                      |             |                         |
|   | QQT2676     | "                       |
| *For Asia, Latin America, Middle East and Africa areas. |             |                         |
| <b>PACKINGS</b>   |             |                         |
| P1  | QPN3901     | Inside Carton           |
| P2  | QPA0493     | Cushion (A)             |
| P3  | QPA0494     | Cushion (B)             |
| P4  | XZB36X46A02 | Poly Bag                |

## SCHEMATIC DIAGRAM

### MAIN AMP SECTION



**SPECIFICATIONS** \* Input level control...MAX

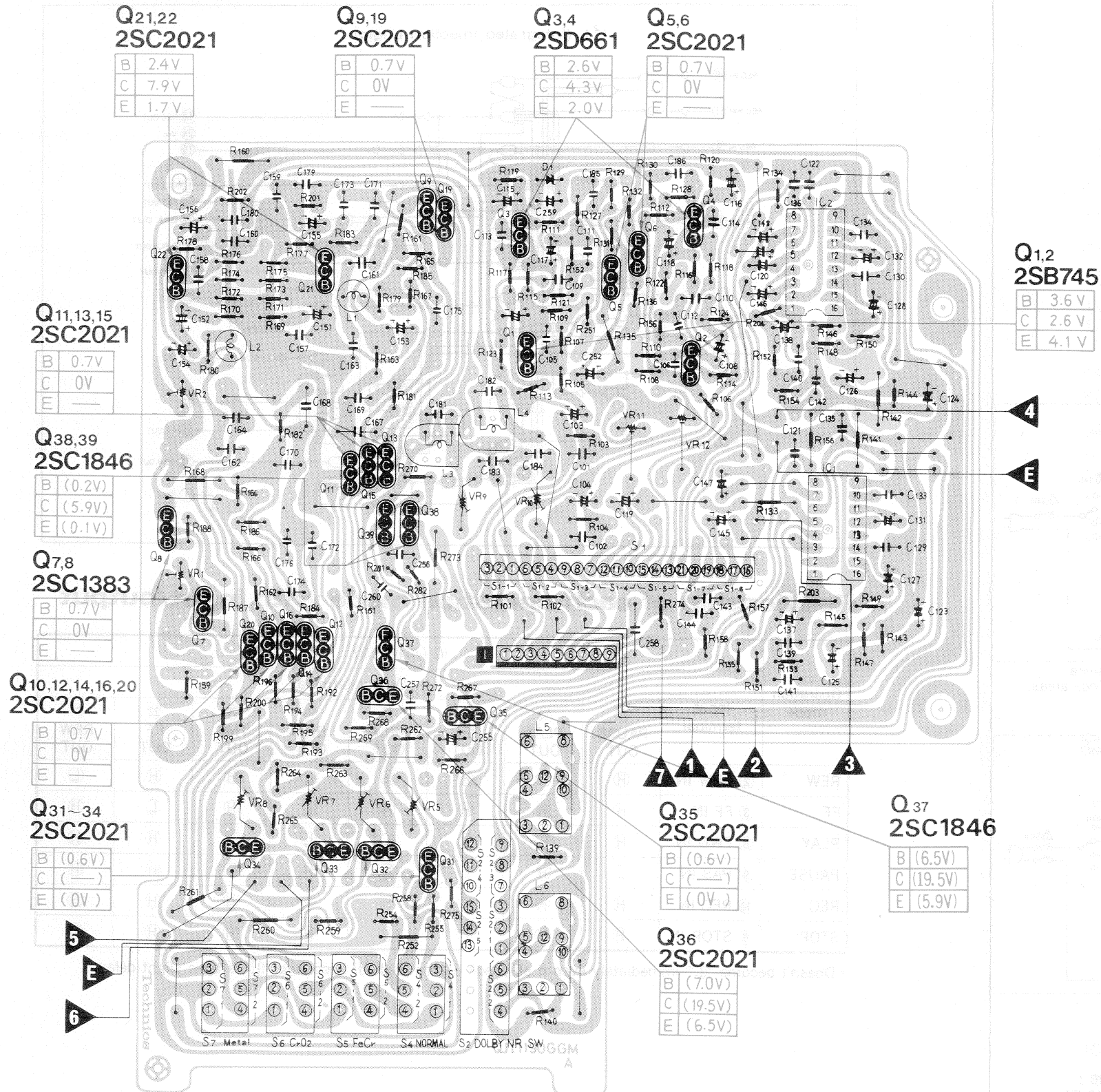
|   |   |
|---|---|
| Playback S/N ratio<br>Test tape... QZZCFM   | More than 47 dB                         |
| Overall distortion<br>Test tape<br>... QZZCRA for Normal<br>... QZZCRX for CrO <sub>2</sub><br>... QZZCRY for Fe-Cr<br>... QZZCRZ for Metal | Less than 3.5%                          |
| Overall S/N ratio<br>Test tape... QZZCRA  | More than 45 dB<br>(without NAB filter) |

**NOTE:**

- |                    |   |  |   |
|--------------------|---|--|---|
| • S1-1~S1-7 .....  | Record/playback select switch (shown in playback position). | • VR10 .....   | Bias current adjustment VR (for Normal tape). |
| • S2-1~S2-5 .....  | Dolby IN/OUT select switch (shown in OUT position).         | • VR11, 12 .....   | Playback gain adjustment VR.                  |
| • S3-1~S3-3 .....  | Input MIC/LINE select switch (shown in LINE position).      | • VR13, 14 .....   | Input level control.                          |
| • S4-1, S4-2 ..... | Tape select switch (for Normal tape).                       | • L3, 4 .....  | Bias trap coil.                               |
| • S5-1, S5-2 ..... | Tape select switch (for Fe-Cr tape).                        | • Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise.  |   |
| • S6-1, S6-2 ..... | Tape select switch (for CrO <sub>2</sub> tape).             | K = 1,000 $\Omega$ .   |   |
| • S7-1, S7-2 ..... | Tape select switch (for Metal tape).                        | • Capacity are in microfarads ( $\mu$ F) unless specified otherwise.   |   |
| • VR1, 2 .....     | Recording current adjustment VR.                            | P = Pico-farads.   |   |
| • VR5 .....        | Bias current adjustment VR (for Normal tape).               | • All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position. |   |
| • VR6 .....        | Bias current adjustment VR (for Fe-Cr tape).                | For measurement, use VTVM.   |   |
| • VR7 .....        | Bias current adjustment VR (for CrO <sub>2</sub> tape).     | • The voltage enclose ( ) indicates are measured during record mode.   |   |
| • VR8 .....        | Erase current adjustment VR (for Metal tape).               | • The mark (▼) shows test point. e.g. ▼ = Test point 1.  |   |
| • VR9 .....        | Bias current adjustment VR (for Metal tape).                |  |   |

# CIRCUIT BOARD

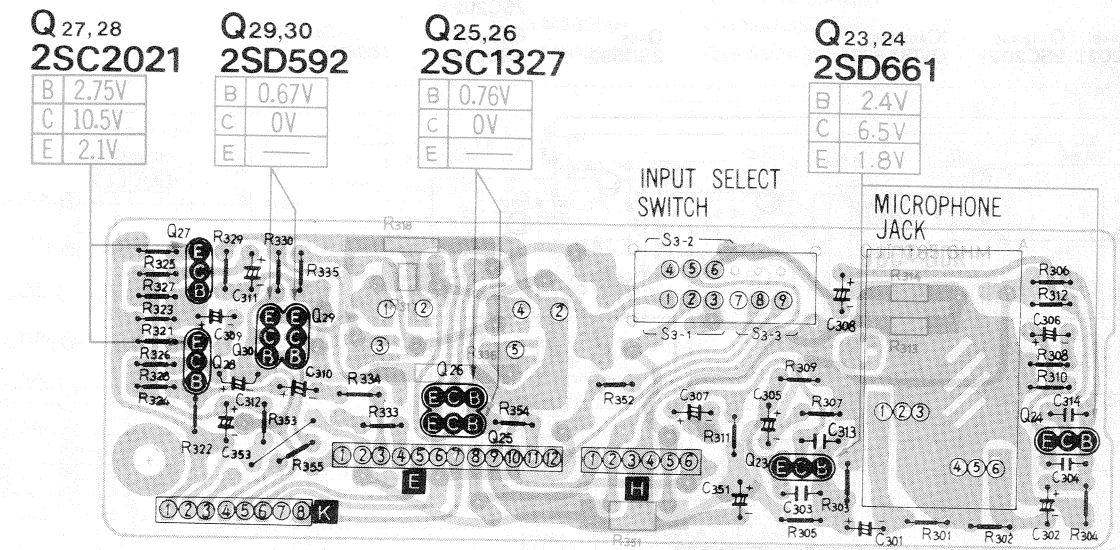
## MAIN AMP CIRCUIT BOARD



NOTE:

The circuit shown in red on the conductor is +B (bias) circuit. Values indicated in    are DC voltages between the chassis and electrical parts. The voltage enclose ( ) indicates are measured during record mode.

## JACK CIRCUIT BOARD



NOTE: RESISTORS

ERD ... Carbon  
ERG ... Metal-oxide  
ERO ... Metal-film  
ERX ... Metal-film  
ERQ ... Fuse type metallic  
ERC ... Solid  
ERF ... Cement

CAPACITORS

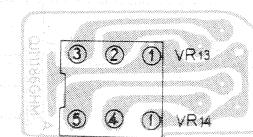
ECG□ ..... Ceramic  
ECK□ ..... Ceramic  
ECC□ ..... Ceramic  
ECF□ ..... Ceramic  
EQQM ..... Polyester film  
ECQE ..... Polyester film  
ECQF ..... Polypropylene  
ECE□ ..... Electrolytic  
ECE□N ..... Non polar electrolytic  
EQQS ..... Polystyrene  
ECS□ ..... Tantalum

**NOTE:** ⚠ indicates that only parts specified by the manufacturer be used for safety.

## LED CIRCUIT BOARD



# INPUT LEVEL CONTROL CIRCUIT BOARD



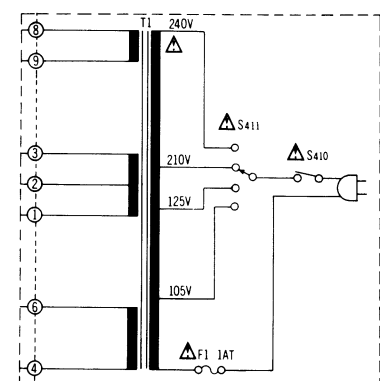
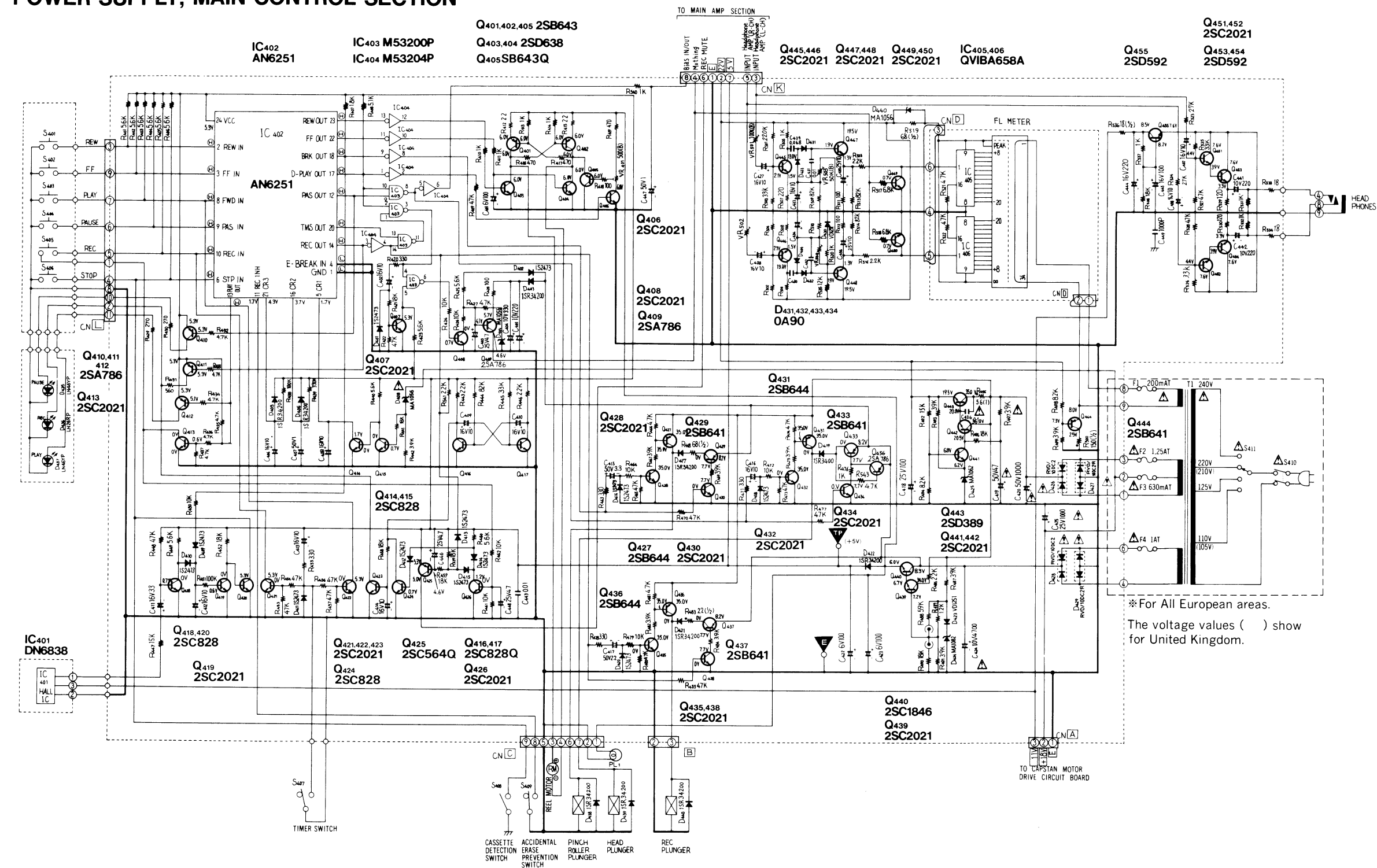
| Ref. No.                | Part No.   | Ref. No.                      | Part No.   | Ref. No.            | Part No.   |
|-------------------------|------------|-------------------------------|------------|---------------------|------------|
| <b><u>RESISTORS</u></b> |            |                               | R147, 148  | R201, 202           |            |
| R101, 102               |            | R149, 150                     | ERD25TJ184 | R203, 204           | ERD25FJ472 |
| R103, 104               | ERD25FJ100 | R151, 152                     | ERD25TJ274 | R251                | ERD25TJ474 |
| R105, 106               | ERD25TJ104 | R153, 154                     | ERD25TJ473 | R252                | ERD25FJ562 |
| R107, 108               | ERD25FJ101 | R155                          | ERD25FJ332 | R254                | ERD25FJ103 |
| R109, 110               | ERD25TJ224 | R156                          | ERD25TJ105 | R255                | ERD25FJ472 |
| R111, 112               | ERD25FJ103 | R157, 158                     |            | R258, 259, 260, 261 | ERD25FJ822 |
| R113, 114               | ERD25TJ224 | R159                          | ERD25FJ181 | R262, 263, 264      |            |
| R115, 116               | ERD25TJ273 | R160                          | ERD25FJ682 | R265                | ERD25FJ272 |
| R117, 118               | ERD25TJ394 | R161, 162                     | ERD25FJ682 | R266                | ERD25FJ332 |
| R119, 120               | ERD25FJ101 | R163, 164                     | ERD25FJ682 | R267                | ERD25FJ101 |
| R121, 122               | ERD25FJ182 | R165, 166                     | ERD25FJ392 | R268                | ERD25TJ333 |
| R123, 124               | ERD25FJ822 | R167                          | ERD25FJ103 | R269                | ERD25FJ102 |
| R125, 126               | ERD25FJ151 | R168                          | ERD25TJ273 | R271                | ERD25FJ103 |
| R127, 128               | ERD25TJ123 | R169, 170                     | ERD25TJ273 | R272                | ERD50FJ120 |
| R131, 132               | ERD25FJ472 | R171, 172                     | ERD25FJ332 | R273                | ERD25FJ182 |
| R133, 134               | ERD25TJ224 | R173, 174                     | ERD25TJ333 | R274                | ERD25FJ472 |
| R135, 136               | ERD25FJ101 | R175, 176                     | ERD25TJ224 | R275                | ERD25FJ181 |
| R139, 140               | ERD25FJ222 | R177, 178                     | ERD25FJ562 | R281, 282           | ERD25FJ220 |
| R141, 142               | ERD25FJ334 | R179, 180                     | ERD25FJ821 | R285                | ERD25FJ332 |
| R143, 144               | ERD50FJ271 | R181, 182                     | ERD25FJ220 | R301, 302           | ERD25TJ273 |
|                         | ERD25FJ102 | R183, 184, 185, 186           | ERD25FJ122 | R303, 304           | ERD25TJ823 |
|                         |            | R187, 188                     | ERD25FJ472 | R305, 306           | ERD25TJ564 |
|                         |            | R191, 192, 193, 194, 195, 196 | ERD25FJ681 | R307, 308           | ERD25FJ680 |
|                         |            | R199, 200                     | ERD25FJ391 | R309, 310           | ERD25FJ392 |
|                         |            |                               | ERD25FJ221 | R311, 312           | ERD25TJ273 |
|                         |            |                               |            | R321, 322           | ERD25TJ273 |
|                         |            |                               |            | R323, 324           | ERD25TJ124 |



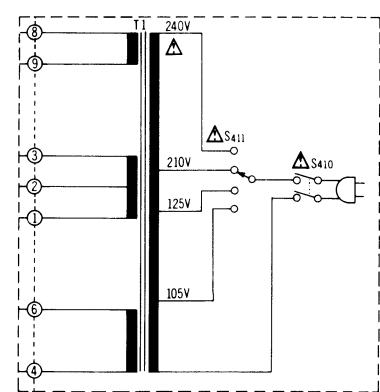


# SCHEMATIC DIAGRAM

## POWER SUPPLY, MAIN CONTROL SECTION



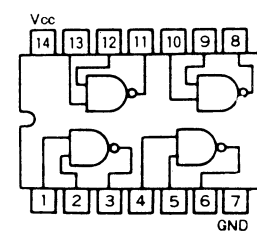
For Asia, Latin America, Middle East and Africa areas.



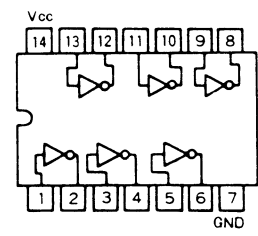
For Australia.

The voltage values ( ) show for United Kingdom.

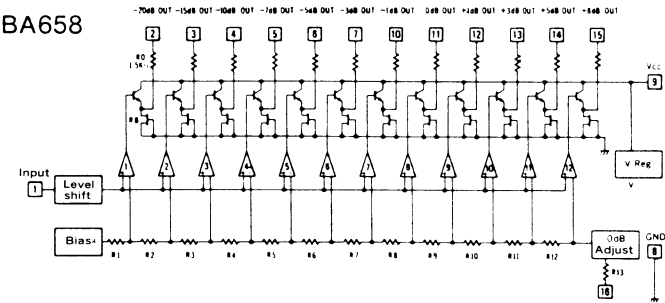
IC403 M53200P



IC404 M53204P



IC405,406 QVIBA658



### NOTE:

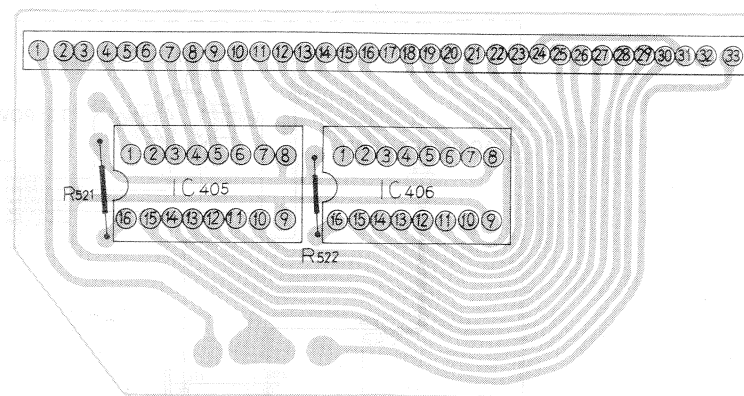
- S401 ..... Rewind button switch.
- S402 ..... Fast forward button switch.
- S403 ..... Playback button switch.
- S404 ..... Pause button switch.
- S405 ..... Record button switch.
- S406 ..... Stop button switch.
- S407 ..... Timer switch.
- S408 ..... Cassette detection switch.
- S409 ..... Erase safety switch.
- S410 ..... Power ON/OFF switch.
- VR401 ..... Takeup torque adjustment VR.
- VR501, VR502 ..... FL meter adjustment VR (for "0dB").
- VR503, VR504 ..... FL meter adjustment VR (for "-20dB").
- Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise. K = 1,000  $\Omega$ .
- Capacity are in microfarads ( $\mu F$ ) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position. For measurement, use VTVM.
- $\Delta$  indicates that only parts specified by the manufacturer be used for safety.

- VR501, VR502 ..... FL meter adjustment VR (for “0dB”).
- VR503, VR504 ..... FL meter adjustment VR (for “-20dB”).
- Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise.  
K = 1,000  $\Omega$ .
- Capacity are in microfarads ( $\mu F$ ) unless specified otherwise.  
P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position.  
For measurement, use VTVM.
- $\Delta$  indicates that only parts specified by the manufacturer be used for safety.



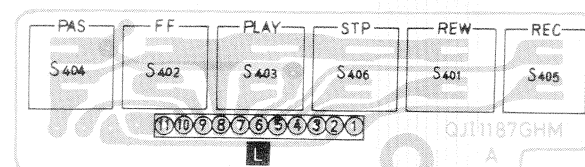


# FL METER CIRCUIT BOARD



IC 405,406  
QVIBA658A

# CONTROL KEY SWITCH CIRCUIT BOARD



# LED CIRCUIT BOARD



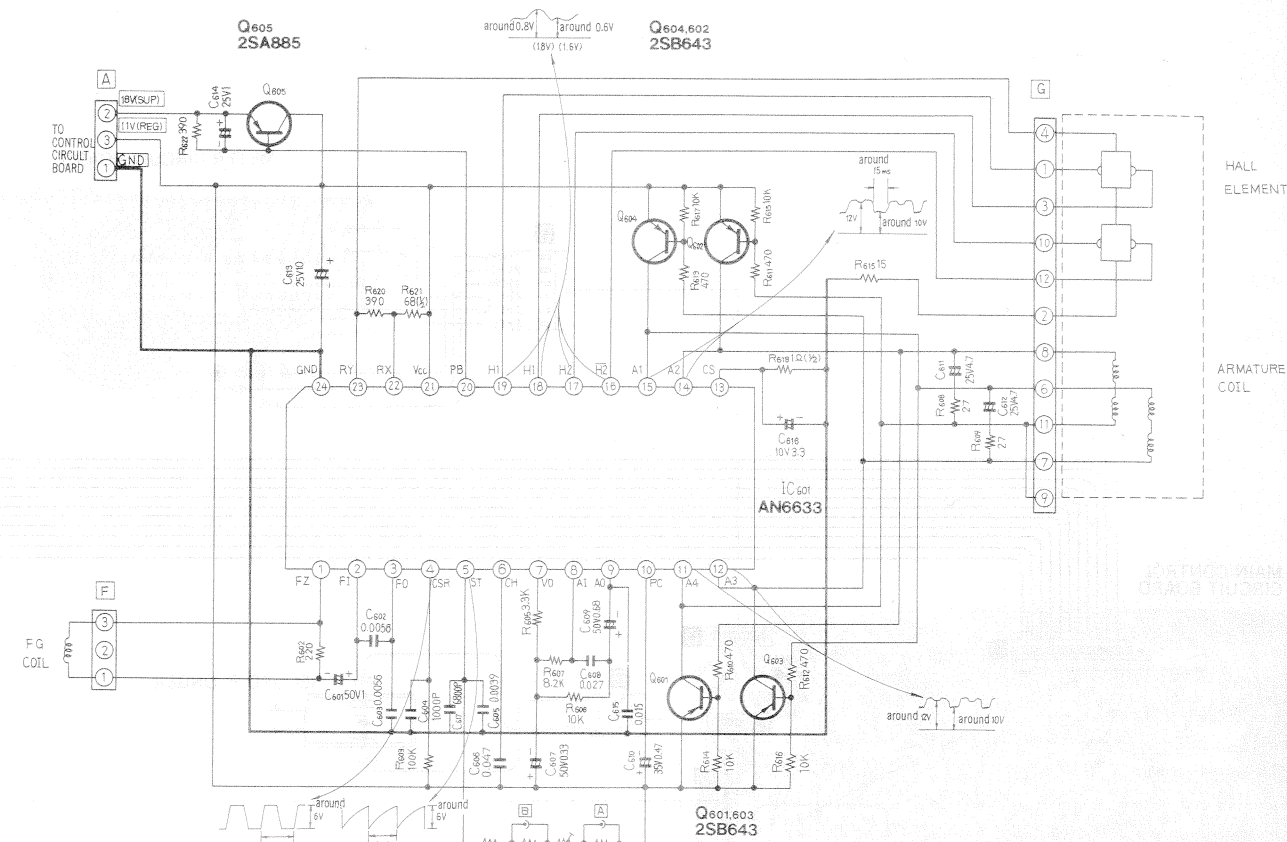
# HALL IC CIRCUIT BOARD



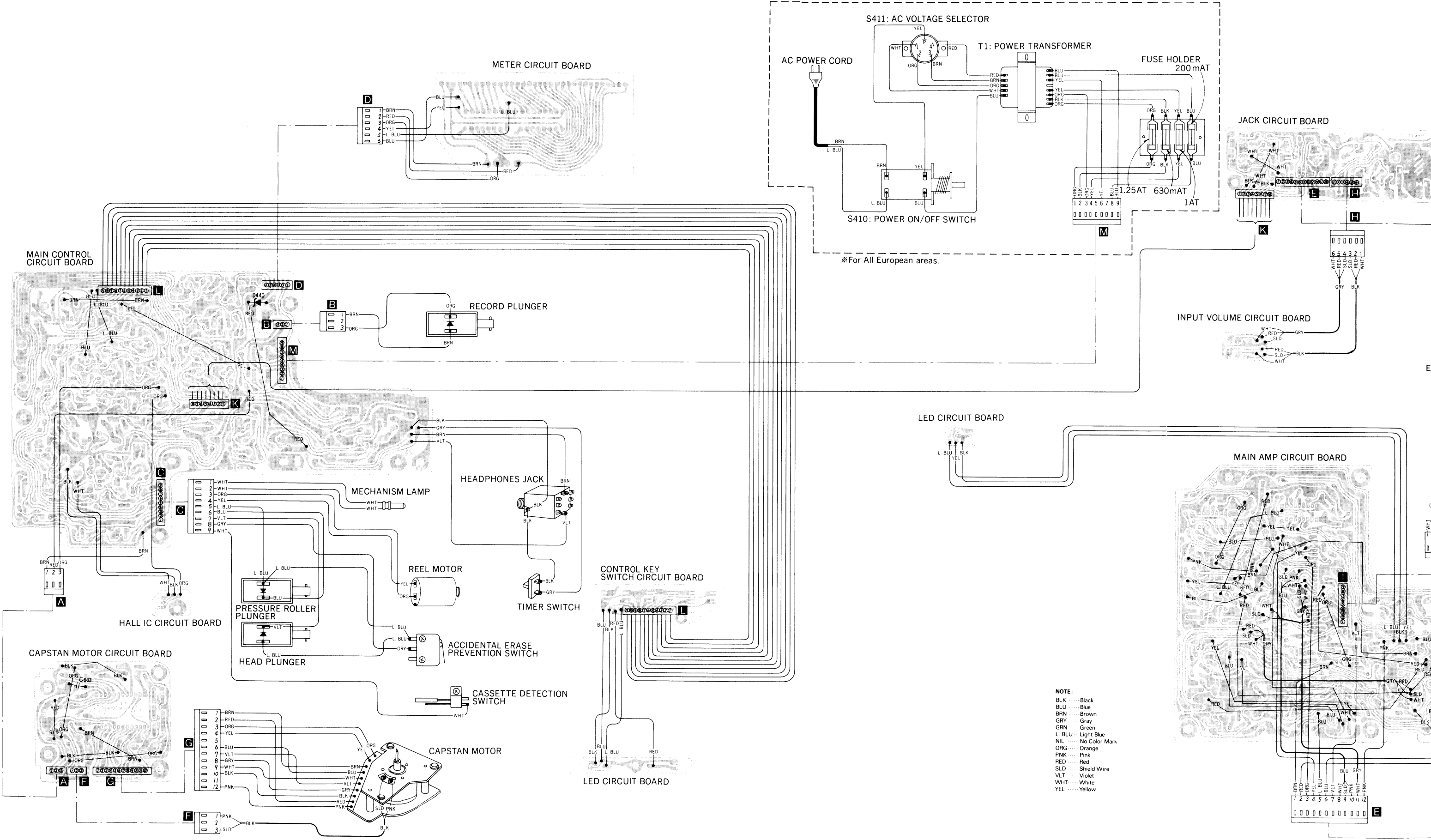
## NOTE:

The circuit shown in red on the conductor is +B (bias) circuit. Values indicated in   are DC voltage between the chassis and electrical parts.

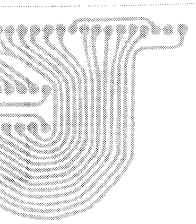
# SCHEMATIC DIAGRAM CAPSTAN MOTOR SECTION



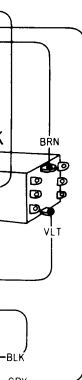
# WIRING CONNECTION DIAGRAM



Circuit Board

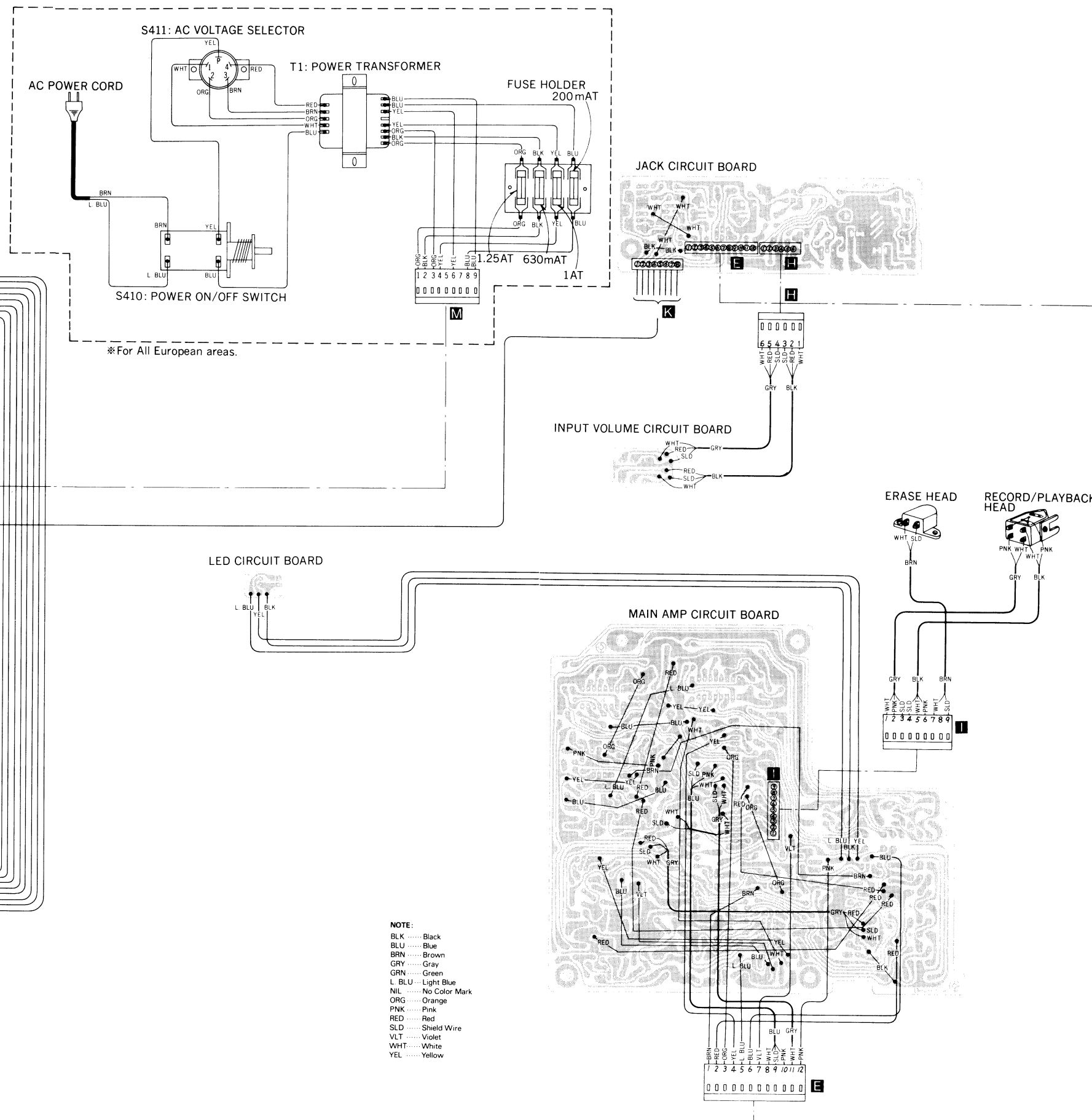


R

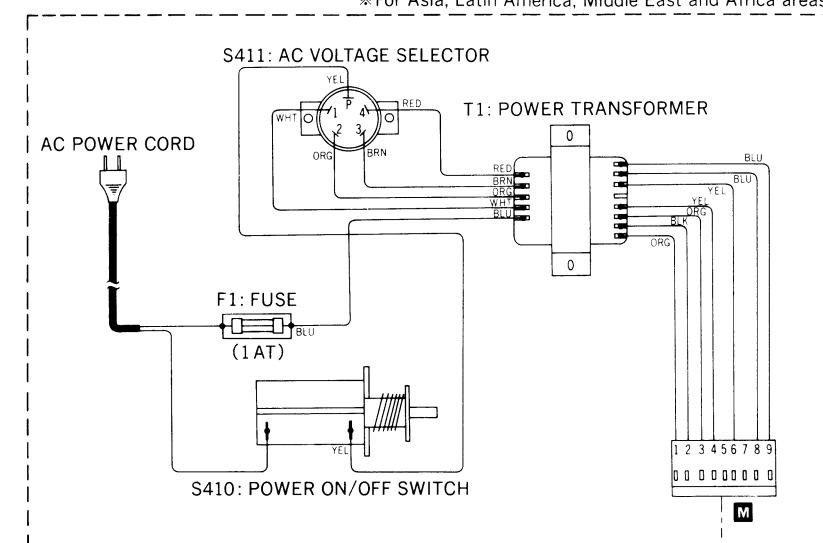


SWITCH

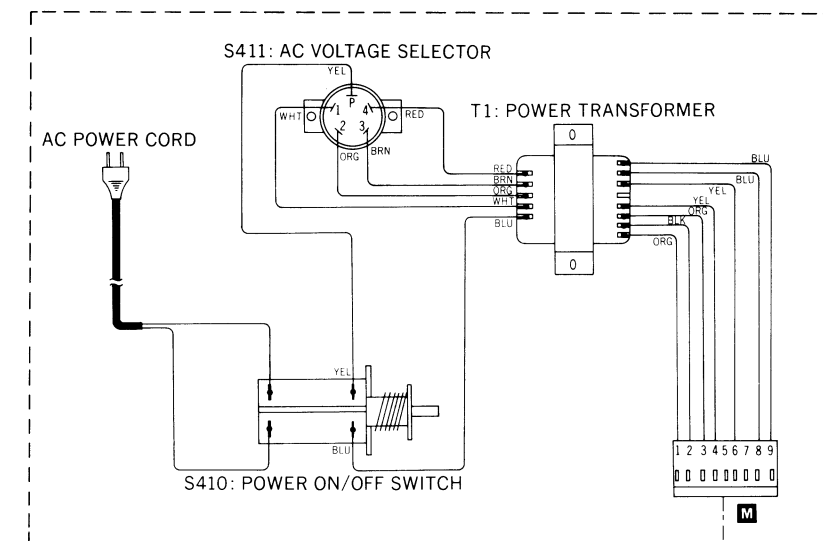
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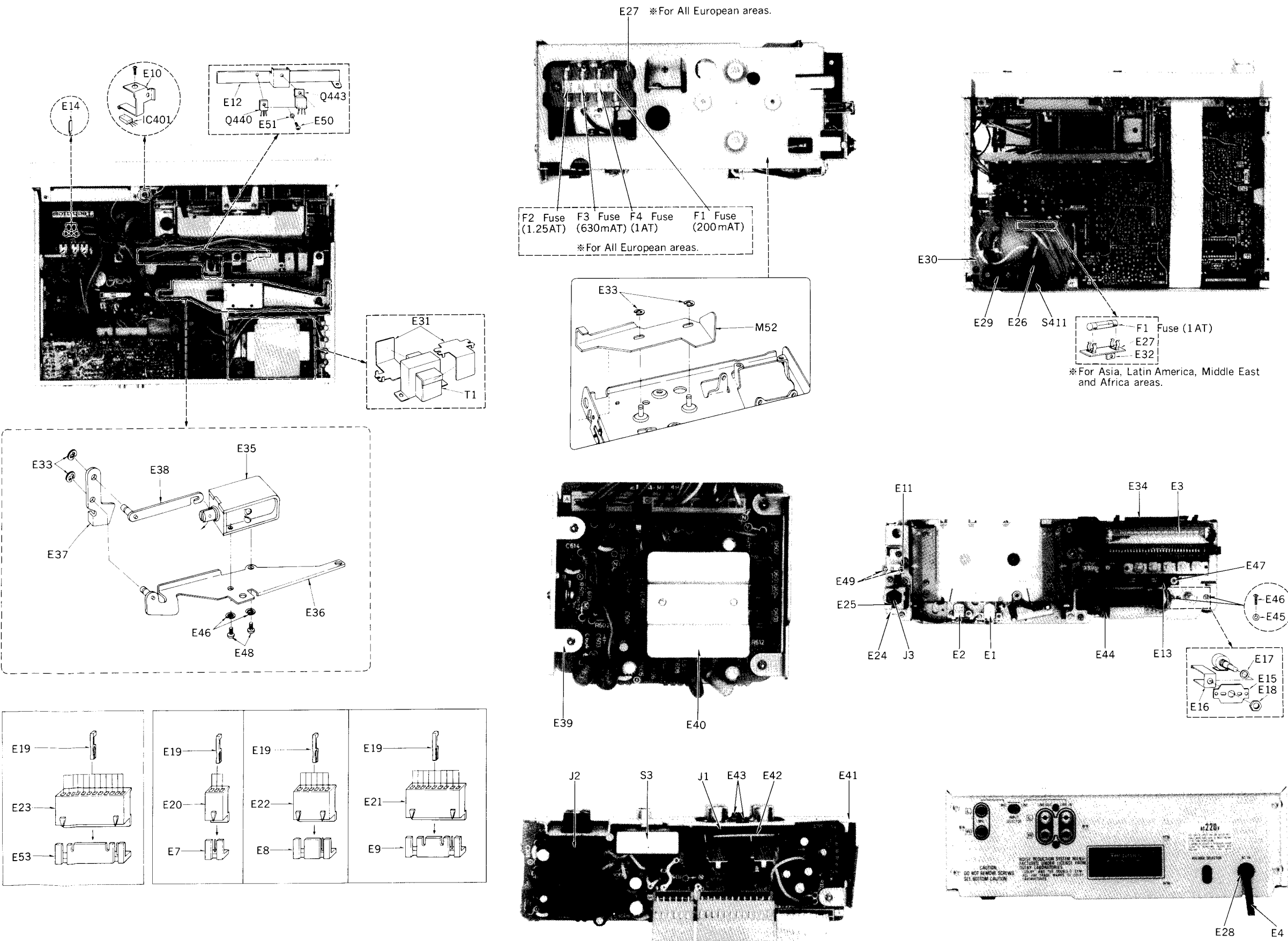
**\*For Asia, Latin America, Middle East and Africa areas.**



**\*For Australia.**



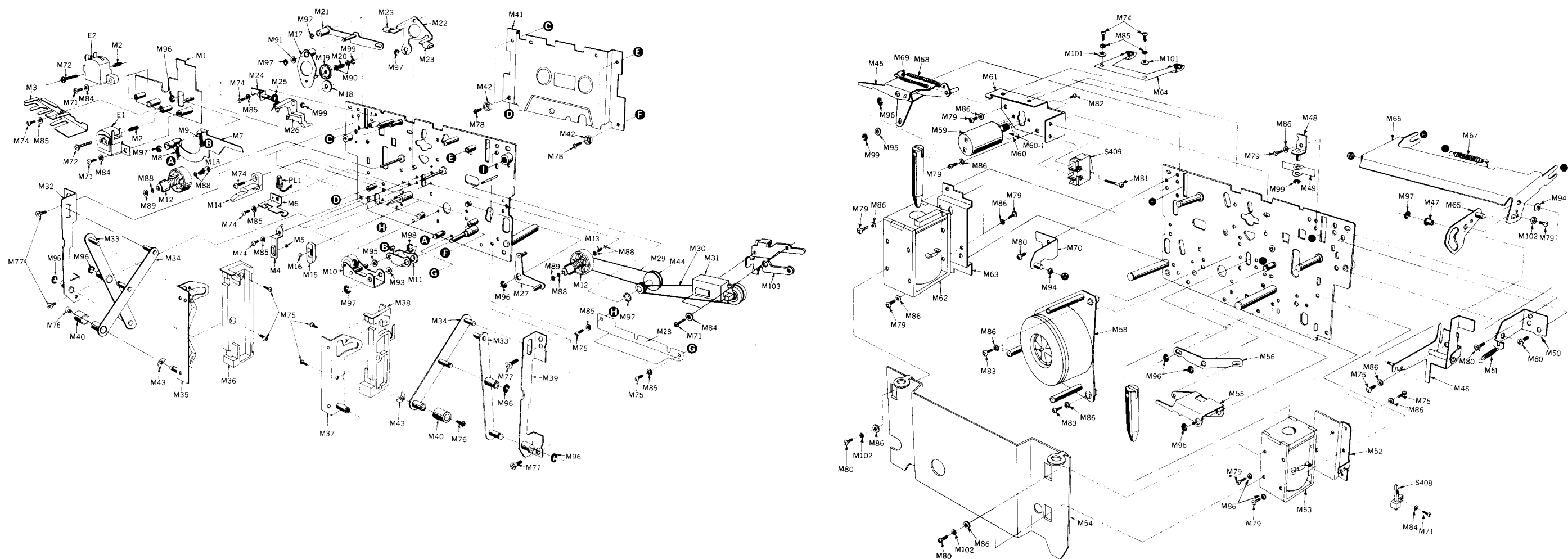
ELECTRICAL PARTS LOCATION



| ELECTRICAL PARTS   |           |                          |
|--|-----------|--------------------------|
| Ref. No.   | Part No.  | Part Name & Description  |
| E1   | WY1416ZA  | Record/Playback Head     |
| E2   | QWY2133Z  | Erase Head               |
| E3   | QSL5004RF | Fluorescent Level Meter  |
| E4   | QFC1204M  | AC Power Cord            |
| *For All European areas except United Kingdom.           |           |                          |
| Δ QFC1205M   |           |                          |
| *For United Kingdom.                                     |           |                          |
| Δ QFC1200M   |           |                          |
| *For Asia, Latin America, Middle East and Africa areas.  |           |                          |
| Δ QFC1208M   |           |                          |
| *For Australia.  |           |                          |
| E7   | QJP1921TN | 3 Pin Post               |
| E8   | QJP1922TN | 6 Pin Post               |
| E9   | QJP1923TN | 9 Pin Post               |
| E10  | QMA3755   | Hall IC Angle            |
| E11  | QMA3758   | Switch Angle (Timer rec) |
| E12  | QTH1148   | Heat Sink                |
| E13  | QKJ0358   | LED Holder (A)           |
| E14  | QJT1067   | Check Pin                |
| E15  | QMF2070   | Volume Angle             |
| E16  | QTW1166   | Insulator Plate          |
| E17  | XWS9A     | Washer                   |
| E18  | QNJ1039   | Nut                      |
| E19  | QJT1054   | Contact                  |
| E20  | QJS1921TN | 3 Pin Housing            |
| E21  | QJS1923TN | 9 Pin Housing            |
| E22  | QJS1922TN | 6 Pin Housing            |
| E23  | QJS1924TN | 12 Pin Housing           |
| E24  | QMA3753   | Headphones Angle         |
| E25  | QNJ1051   | Nut                      |
| E26  | QTFM0026  | Switch Cover             |
| E27  | QTF1039A  | Fuse Holder              |
| *For All European areas.                                 |           |                          |
| QTF1033  |           |                          |
| *For Asia, Latin America, Middle East, and Africa areas. |           |                          |
| E28  | QBJ1425A  | Cord Bushing             |
| *For All European areas and Australia.                   |           |                          |
| QTD1129  |           |                          |
| *For Asia, Latin America, Middle East and Africa areas.  |           |                          |
| QTD1164  |           |                          |
| *For All European areas and Australia.                   |           |                          |
| E29  | QMA3754A  | Transformer Angle        |
| E30  | QTS1488   | Shield Plate             |
| E31  | QMA3122   | Fuse Angle               |
| *For Asia, Latin America, Middle East and Africa areas.  |           |                          |
| E33  | XUC3FT    | Stop Ring                |
| E34  | QKJ0357   | Meter Angle              |
| E35  | QME0147BK | Plunger                  |
| E36  | QMF2068   | Plunger Angle            |
| E37  | QML3501   | Plunger Lever (1)        |
| E38  | QML3502   | Plunger Lever (2)        |
| E39  | QTH1147   | Heat Sink (A)            |
| E40  | QTH1136   | Heat Sink                |
| E41  | QMA3761   | Jack Angle               |
| E42  | QMF2069   | Jack Board Angle         |
| E43  | XSN3+6BNS | Screw 6x6                |
| "Silver Type"  |           |                          |
| XSN3+6BNS  |           |                          |
| "Black Type"   |           |                          |
| E44  | XTV3+8BFN | Screw 8x8                |
| E45  | XSN3+6S   | Screw 6x6                |
| E46  | XWA3B     | Washer                   |
| E47  | QHQ1177S  | Stop Screw               |
| E48  | XSN3+5S   | Screw 5x5                |
| E49  | XQS16A3FZ | Screw 6x3                |
| E50  | XSN3+8S   | Screw 8x8                |
| E51  | XWG3      | Washer                   |
| E52  | QMR1763   | Switch Rd                |
| E53  | QJP1924TN | 12 Pin Pin               |



EXPLODED VIEWS



| Ref. No.         | Part No. | Part Name & Description        | Ref. No. | Part No.      | Part Name & Description | Ref. No. | Part No.  | Part Name & Description          | Ref. No. | Part No. | Part Name & Description          |
|------------------|----------|--------------------------------|----------|---------------|-------------------------|----------|-----------|----------------------------------|----------|----------|----------------------------------|
| MECHANICAL PARTS |          |                                |          |               |                         |          |           |                                  |          |          |                                  |
| M1               | QXK2029  | Head Base Plate Assembly       | M31      | QXC0051       | Tape Counter Assembly   | M51      | QBT1753   | Playback Lever Spring            | M82      | XSN2+3   | Screw $\varnothing 2 \times 3$   |
| M2               | QBCA0008 | Head Spring                    |          | QXC0055       | "Silver Type"           | M52      | QMA3591A  | Plunger Angle-L                  | M83      | XSN3+8S  | Screw $\varnothing 3 \times 8$   |
| M3               | QTD1261  | Head Wires Clamper             |          | QXC0055       | "Black Type"            | M53      | QME0147   | Plunger                          | M84      | XWA2B    | Spring Washer 2 $\phi$           |
| M4               | QBP1733  | Steel Ball Holder-A            | M32      | QXA0703       | Angle-L Assembly        | M54      | QXA0786   | Mechanism Reinforcement Angle    | M85      | XWA26B   | Spring Washer 2.6 $\phi$         |
| M5               | QDK1012  | Steel Ball 2.5 $\phi$          | M33      | QXL1191       | Link Lever-A Assembly   | M55      | QXL1171   | Plunger Lever-L Assembly         | M86      | XWA3B    | Spring Washer 3 $\phi$           |
| M6               | QMA3321  | Lamp Angle                     | M34      | QXL1190       | Link Lever-B Assembly   | M56      | QML3276   | Plunger Lever                    | M87      | QBW2016  | Poly Washer                      |
| M7               | QXL1168  | Pressure Roller Lever Assembly | M35      | QXA0706       | Holder Angle-L Assembly | M58      | QXK2172   | Capstan Motor Assembly           | M88      | QBW2012  | "                                |
| M8               | QBT1490  | Eject Lever Spring             | M36      | QMH2027       | Cassette Holder-L       | M59      | MKCN22AE5 | Reel Motor                       | M89      | QBW2008  | "                                |
| M9               | QBT1441  | Pressure Roller Spring         | M37      | QXA0705       | Holder Angle-R Assembly | M60      | QXP0574   | Motor Pulley Assembly            | M90      | QBW2015  | "                                |
| M10              | QXL1166  | Pressure Roller Assembly       | M38      | QMH2028       | Cassette Holder-R       | M60-1    | XXE26D3FZ | Set Screw                        | M91      | QBW2017  | "                                |
| M11              | QML3267  | Pressure Roller Lever-1        | M39      | QXA0704       | Angle-R Assembly        | M61      | QMA3313   | Motor Angle                      | M92      | QBW2018  | "                                |
| M12              | QXD0087  | Reel Table                     | M40      | QKJ0245       | Spacer-A                | M62      | QXE0249   | Plunger                          | M93      | QBW2016  | "                                |
| M13              | QBC1272  | Back Tension Spring            | M41      | QXH0286       | Mechanism Cover         | M63      | QMA3312   | Plunger Angle-R                  | M94      | QBW2019  | "                                |
| M14              | QMG0054  | Cassette Guide                 |          | "Silver Type" | "                       | M64      | QXH0276   | Cassette Holding Cushion         | M95      | QBK7123  | Fiber Washer                     |
| M15              | QMH2009  | Steel Ball Holder-B            |          | "Black Type"  | "                       | M65      | QXL1173   | Lock Lever Assembly              | M96      | XUC3FT   | Stop Ring 3 $\phi$               |
| M16              | QDK1006  | Steel Ball 3 $\phi$            |          | "Black Type"  | "                       | M66      | QML3282   | Connector Lever                  | M97      | XUC25FT  | Stop Ring 2.5 $\phi$             |
| M17              | QXL1189  | Idler Lever Assembly           |          | "Black Type"  | "                       | M67      | QBT1553   | Holder Spring-R                  | M98      | XUC5FT   | Stop Ring 5 $\phi$               |
| M18              | QBF1260  | Idler Felt                     |          | "Black Type"  | "                       | M68      | QBT1405   | Lever Spring                     | M99      | XUC2FT   | Stop Ring 2 $\phi$               |
| M19              | QXI0101  | Idler Assembly                 |          | "Black Type"  | "                       | M69      | QBT1713   | Record Spring                    | M100     | XSN26+6  | Screw $\varnothing 2.6 \times 6$ |
| M20              | QBC1308  | Idler Spring                   |          | "Black Type"  | "                       |          |           |                                  |          |          |                                  |
| M21              | QXL1164  | Brake Lever Assembly           |          | "Black Type"  | "                       | M70      | QXA0702   | Connector Angle-R Assembly       | M101     | XWG26    | Flat Washer                      |
| M22              | QML3273  | Brake                          |          | "Black Type"  | "                       | M71      | XSN2+6    | Screw $\varnothing 2 \times 6$   | M102     | XWC3B    | Lock Washer                      |
| M23              | QBG1132  | Stopper Rubber                 | M42      | QMZ1213       | Spacer-B                | M72      | QH01211   | Head Adjustment Screw            | M103     | QMA3750  | Counter Angle                    |
| M24              | QXA0714  | Detection Angle Assembly       | M43      | QBP1135       | Spring Washer           | M74      | XSN26+4   | Screw $\varnothing 2.6 \times 4$ | M104     | XSN2+4   | Screw $\varnothing 2 \times 4$   |
| M25              | QBN1573  | Detection Lever Spring         | M44      | QDP1811       | Connection Pulley       | M75      | XSN26+4BV | Screw $\varnothing 2.6 \times 4$ | M105     | QH01182A | Step Screw                       |
| M26              | QML3285  | Detection Lever                | M45      | QXL1165       | Lever-B Assembly        | M76      | XSS2+4    | Screw $\varnothing 2 \times 4$   |          |          |                                  |
| M27              | QXL1172  | Lever-A Assembly               | M46      | QXL1311       | Eject Lever Assembly    | M77      | XSS3+4S   | Screw $\varnothing 3 \times 4$   |          |          |                                  |
| M28              | QTS1451  | Shield Plate                   | M47      | QDP1758       | Roller                  | M78      | QH01185   | Step Screw                       |          |          |                                  |
| M29              | QDB0167  | Counter Belt-A                 | M48      | QXA0713       | Angle Assembly          | M79      | XSN3+5S   | Screw $\varnothing 3 \times 5$   |          |          |                                  |
| M30              | QDB0259  | Counter Belt-B                 | M49      | QML3284       | Release Lever           | M80      | XSS3+6S   | Screw $\varnothing 3 \times 6$   |          |          |                                  |
|                  |          |                                | M50      | QMA3314       | Connector Angle         |          |           |                                  |          |          |                                  |
|                  |          |                                |          |               |                         | M81      | QH01182   | Step Screw                       |          |          |                                  |

| SPECIFICATIONS              |                         |
|-----------------------------|-------------------------|
| Pressure of pressure roller | 400 $\pm$ 30 gr         |
| Wow and flutter: JIS        | Less than 0.04 % (WRMS) |